

# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE:

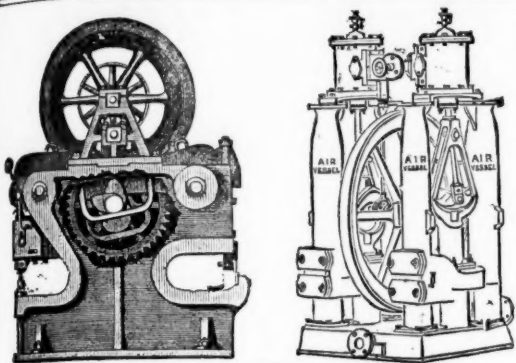
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2038.—VOL. XLIV.

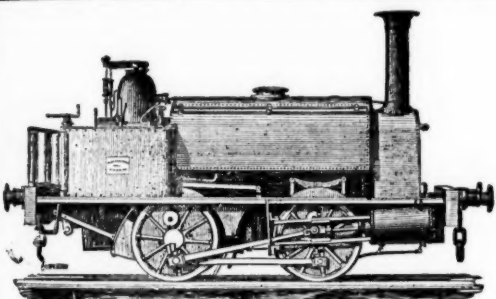
LONDON, SATURDAY, SEPTEMBER 12, 1874.

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Patent No. 4136 : : : : : Dated 16th December, 1873.  
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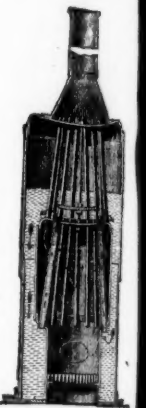
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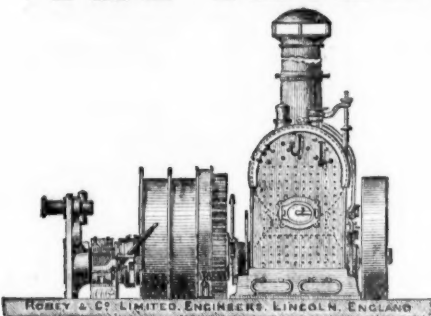
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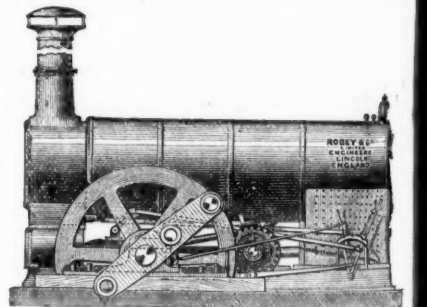
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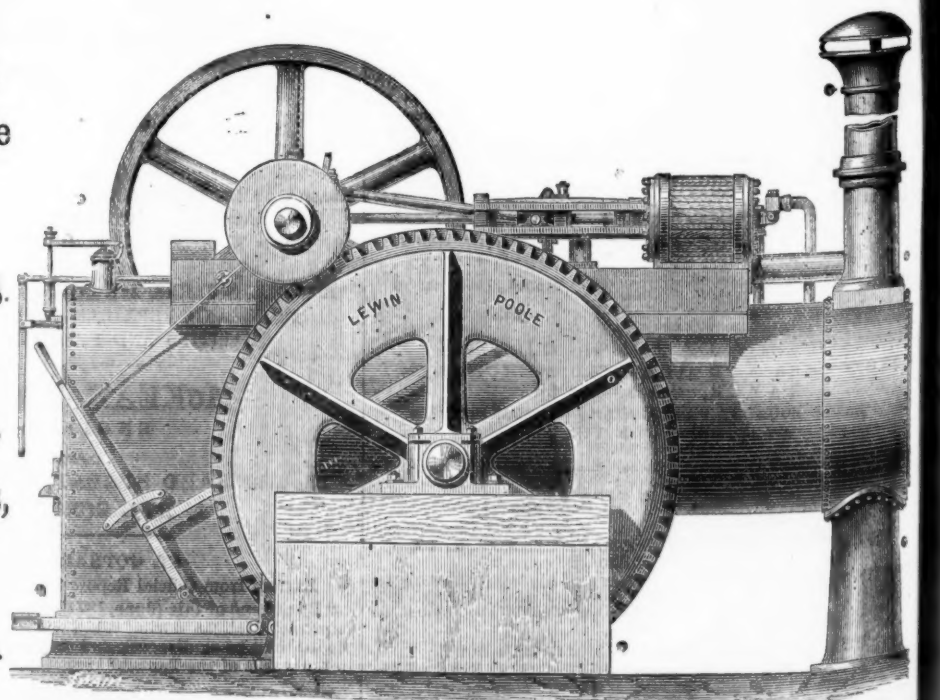
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## Original Correspondence.

## THE IRON AND STEEL INSTITUTE AT BARROW.

BY AN OBSERVANT MEMBER.

Barrow was very appropriately selected for the sixth provincial meeting of the Iron and Steel Institute. It is in all respects a remarkable place. Its growth has been more rapid than that of any other town of similar size in the United Kingdom, extending from a mere handful of not more than 200 or 300, to a population of 35,000 at the present time. And yet if we were asked to point out the essential elements of Barrow's greatness we should almost find ourselves at a loss. It has not the combination of cheap ore and cheap fuel to be found in Cleveland and in the West of Scotland, nor has it the old standing reputation and splendid resources of Staffordshire and Wales. It has, no doubt, command of an almost inexhaustible supply of splendid hematite ores, specially adapted for the manufacture of Bessemer steel; and it has also the control of water, for the purposes of transport, to an extent that few, if any, of the ports in the kingdom can rival. But to an ordinary mind neither of these causes by itself, nor even the two in conjunction, would seem sufficient to account for the mushroom-like growth of the town. In respect of these advantages, indeed, Barrow is little or no better off than Whitehaven, Workington, and Maryport, on the same coast. Nay, if there is anything in it, Whitehaven should be better off for natural resources than Barrow, for it is within a few miles—not more than half-a-dozen—of the ironstone of Cleator Moor, while it has close at hand an excellent supply of coal, a desideratum which Barrow does not possess. And yet we find that Whitehaven has been more than a century in attaining a population of 10,500, while Barrow has within a fifth of that period attained a population more than treble in extent. Again, it may be said that Workington is better provided with the means of industrial development than Barrow, for it has both coal and ironstone within a distance of six miles, an excellent stream adapted for shipyards, &c., scope for unlimited harbour accommodation, and has within the last half-dozen years become the nucleus of large iron and steel works. And yet the population of Workington, notwithstanding that the town is much older, is very far behind that of the capital of Furness. The truth is that we must go underneath and beyond all that appears on the surface, if we would interpret aright the cause of Barrow's progress. Much as it is due to its splendid situation as a port of shipment, and to the near proximity of inexhaustible supplies of iron ore, it is owing still more to the pluck, perseverance, and energy of the half-dozen capitalists who have really made the place all that it is.

It is not (as the President of the Institute remarked at the dinner given to the Institute by the Barrow Hematite Iron and Steel Company) every place that has been fostered and promoted so assiduously by two noble dukes as Barrow has been; but much as the town owes to the Dukes of Devonshire and Buccleuch, it is under not less obligation to Sir James Ramsden, to Mr. Schneider, to Mr. Hannay, and to Mr. Josiah T. Smith. To these gentlemen, either singly or as a whole, Barrow may be said to belong, and not Barrow alone, but all its adjuncts, including the Furness Railway, and the ships that come into the docks. The two largest industrial establishments in Barrow—the iron and steel works, and the iron ship-building works—have each the Duke of Devonshire, Sir James Ramsden, and Mr. Schneider, on their directorate. The jute works were established and promoted by the same gentlemen, who have it all, or nearly all, their own way in administering the affairs of the town and of the port, and of the only railway by which the town is accessible. Barrow, therefore, may be said to be under an oligarchy, although of so mild and beneficent a character that the inhabitants would not, if they could, cast off their allegiance. The pluck and enterprise of these capitalists is everywhere displayed, but not in a form that indicates rashness or want of premeditation. From its earliest beginnings Barrow has been guided and controlled by some master minds. Men with a better faculty for administration than Sir James Ramsden and Mr. J. T. Smith it would probably be difficult to find; and men more ready to help forward every good work than the Dukes of Buccleuch and Devonshire would be prodigies of their kind. Here, therefore, will be found the reasons which cannot be assigned satisfactorily by any other process of mental analysis for the attainment of Barrow's present stature among the industrial giants of the United Kingdom. It has been the hobby and the delight of these gentlemen to make Barrow not, perhaps, the eighth wonder of the world, but a place which people would regard with surprise and admiration, as we are accustomed to look upon the unique creation of Sir Titus Salt in the West Riding of Yorkshire, and they have in a high degree succeeded.

The first thing, probably, that strikes the casual observer in a visit to Barrow is its unfinished character. This is made manifest everywhere in an almost painful degree, and certainly to such an extent as to destroy completely any sense of aesthetic beauty. Very few of the streets have received the finishing touches from their builders' hands. The strand is so far built up that it may be said to be an exception to this rule. On one side of this thoroughfare there are shops and dwelling-houses, on the other a dead wall, relieved here and there by a building, runs along its entire length, and encloses most of the works in that part of the town, the object of their erection here being that of enabling them to take advantage of the branch line of the Furness Railway, which skirts the Devonshire and Ramsden Docks, and to procure the shipping facilities which the near proximity to the docks themselves can afford. Among the other principal streets Duke-street is the only one which appears to be getting into a condition of maturity. This is really a fine thoroughfare, of good width, and having some shops and warehouses that would not do discredit to a metropolitan town. Near the centre of Duke-street a fine square is being formed, to be named after Sir James Ramsden, whose statue is erected in its centre. Of the other special features of Barrow I shall have more to say as I go on.

The meetings of the Institute were less conspicuous for scientific interest than those held on previous occasions. The first day's proceedings were really tame, and the interest may be said to have concentrated in a discussion of the question whether the magnetic deposits of Sweden were kindred with those of the Barrow district in respect of their origin, and whether that origin was of an electric or aqueous character. The function of the Institute is not, however, that of discussing questions like this, which are almost altogether of a speculative character, and the settlement of which cannot be attended with any commercial result. It is easy to understand a purely geological or an archaeological society giving up its time to the consideration of recondite problems of this sort; but unless there is a commercial aspect in the questions brought up for discussion at the meetings of the Iron and Steel Institute they will fail to attach itself to the discussion of the importation of iron ores from Sweden. It appears that there is an almost inexhaustible supply of a rich quality of hematite ores in that country, but as Sweden is entirely destitute of coal supplies it has to be melted with charcoal. Most of the coke and coal used in Sweden is imported from England, the cost of freight being from 18s. to 20s. per ton, so that as soon as the forests become exhausted the manufacture of iron, on account of the excessive dearthness of fuel, cannot be profitably carried on in that country. The ore of Sweden, or, at any rate, a large portion of it, is specially adapted for fettling purposes; but although Mr. John Gjers, of Middlesbrough, and others have tried to introduce it for the purpose, the small encouragement offered to the importation of this ore into England by the Swedes themselves, and their excessive cost delivered at the principal centres of our iron trade, were such as to deter their application on a large scale. There was very little hope held out, therefore, of an extensive trade being opened up between this country and Sweden, although the ores of that country constitute a sort of reserve fund on which the ironmasters and steel makers of England will always, in case of straits, be able to depend. The paper by Mr. Alexander Brogden, M.P., "On the Rampside Boring," introduced to the Institute the probability of finding coal in the neighbourhood of Barrow. It is still, as it has been for many years past, a vexed question whether there is coal underneath the

sandstone deposits of that district, and efforts of the most determined kind are now being made to arrive at certainty on the matter. There has been a good deal of encouragement to those spirited gentlemen who have undertaken the Rampside boring to persevere in their search, which, if it should be successful and enable coal of a quality suitable for steel making purposes to be worked in the immediate neighbourhood, will provide Barrow with the one thing needful to its industrial pre-eminence as a centre of the steel trade.

The papers read by Mr. Holley, of New York, "On Improvements in Bessemer Machinery," were calculated to give rise to a lively discussion on the relative merits of the two systems pursued on opposite sides of the Atlantic. Mr. Holley's paper showed that in the manufacture of steel our American cousins have attained results of which we have as yet come far short in this country. But its most valuable feature was the discussion on the manufacture of steel by the direct process, which it originated. This is not a new field of controversy. It is not the first time, either, that attempts have been made to produce steel by the direct process; but the results hitherto attendant on such experiments have been so precarious and uncertain as to prevent its adoption on a large scale. It appears, however, that our plucky friend, Mr. Williams, is not yet satisfied. The change of process involved in dispensing with the cupola and running the molten metal direct from the blast-furnace into the converter will save at least 1½ per ton on every ton of steel made. No hope is held out that the adoption of the direct process will cheapen the cost of steel. Mr. Williams, indeed, declares that he is about to make the change simply in order that the firm of which he is the head may get rid of the loss that has hitherto attended the manufacture of steel at the Gorton Works, near Manchester. But it is possible to get economy at the expense of quality, and this is the rock ahead which Mr. Schneider and Mr. J. T. Smith, who failed to see eye to eye with Mr. Williams, appear to dread. They have just reason to look to their reputation at Barrow, for it is a precious possession. As, moreover, the Barrow Company own advantages for carrying on steel making operations that do not exist at Gorton, to which all the iron and fuel has to be carried a considerable distance, they do not so much require to study the possible economy of a few shillings per ton at the probable cost of deteriorating the quality of their productions, and tarnishing the name they have so deservedly obtained. No real result was arrived at on this question, which remains practically where it did. If the experiments which Mr. Williams promises to make had been completed the question of the future of the steel trade would have been advanced another stage towards final settlement; but as it is, we must not expect too much from the change of process about to be attempted by Mr. Williams. Yet, in science there is so little exactitude attained or attainable that much respect ought always to be paid to the old-fashioned lines, and if a man has a new theory to propound, however satisfied of its truth he may be in his own mind, he should put it forward cautiously and with deference, so as not to wound the predilections and prejudices of those who hold a contrary view.

So much time was occupied with the discussion on the papers of Messrs. Holley and Walker on steel making appliances, that very little was left for the ventilation of the question of mechanical puddling, introduced by Mr. Crampton. It was expected that this would be the great paper of the meeting, and its outcome was very disappointing. Mr. Crampton certainly promised to do many fine things with his furnace, and it was very highly spoken of, not only by the patentee himself, but also by Mr. Price, of the Royal Gun Factory, Woolwich, Mr. J. Head, of Middlesbrough, Mr. Briggs, and others, and the President wound up the discussion by indicating his belief that the furnace was a good one. After the result of the Danks process, however, it is not well to expect too much from that of Mr. Crampton, and we can only wait patiently until we ascertain the results that follow from the adoption of his furnace in the Cleveland district, where it is being adopted by the North of England Industrial Iron and Coal Company, and the firm of Fox, Head, and Company, of the Newport Rolling Mills.

There is no other feature of the reading and discussion of papers that seems to me to call for comment, if I except the fact that the exact length of time allowed for this purpose in both days of the meeting only extended to five and a half hours. This compelled the programme to be rather hurriedly gone through, and prevented the full and free interchange of opinion that was to be desired under the circumstances.

## THE BARROW HEMATITE IRON AND STEEL WORKS.

## THE IRON AND STEEL INSTITUTE—THE EXCURSIONS.

It will surprise many of our readers, whose ideas of Barrow are borrowed either from miscellaneous reading or their own internal consciousness, to know that these are the only works of their kind as yet built within four miles of the town. Barrow in this respect is strangely unlike Middlesbrough, although both towns owe their origin and progress to the same—or almost the same—combination of causes. Before Middlesbrough had attained the population now possessed by Barrow there were at least a dozen ironworks in its immediate neighbourhood. But, then, Middlesbrough was developed by as many different firms, while Barrow owes its development to some half-a-dozen gentlemen, who form to all intents and purposes a single firm, and who have been more anxious to make their works the first and best of their kind, rather than sub-divide them into many different branches. It is, however, claimed for the Barrow Works—which were visited with unusual interest by the members of the Iron and Steel Institute during the past week—that if they own the distinction of being the only works of this kind in Barrow and the surrounding neighbourhood, they have also the higher merit of being the largest of the kind in the world.

These splendid works are situated at Hindpool, one of the extremities of Barrow, and overlook the Walney Channel, which, however, is not at this point sufficiently deep to be made available for the purposes of navigation, so that the company send all their produce outside the works by railway, and introduce all their raw material by the same means. The company that own the works have the Duke of Devonshire for their chairman, Sir James Ramsden and Mr. Schneider for practical directors, and Mr. Josiah T. Smith for manager. The company is limited, but is not quoted on the Stock Exchange. The amount of the capital is not accurately known, but it must be enormous. The works cover an area of nearly 100 acres, but, of course, a large part of that area is used for the storage of pig-iron, of which from 6000 to 12,000 tons are generally kept in stock, and coal and coke, of which sometimes there are over 20,000 tons in stock. There are 16 blast-furnaces—14 of them being in a single row, and the other 2 built at what are called the new works, about half a mile off. The company always reckon on having two or three furnaces out of blast for the purposes of alteration and repairs. Most of the furnaces are 65 ft. high. Two of the furnaces first built have been raised from their original height of 42 ft. to a height of 62 ft., their boshes having been proportionately widened. All the furnaces are built on the same principle, having 2 ft. 6 in. of brickwork at their thinnest part, and being lined externally with plates ½ in. in thickness. Most of them have a bosh 21 ft. in diameter, the diameter of the mouth of the furnace being 15 ft. The angle of the bosh is 1 in 3. The blast is carried into the furnaces by a circular hot-blast main 3 ft. in diameter. In each furnace, with only three exceptions, there are six tuyeres, varying from 3½ to 4 in. diameter. All the furnaces, with the exception of two, are provided with the ordinary bell and hopper apparatus for utilising the waste gases in the heaters and boilers; and even in the cases of the two open-topped furnaces provision is made for utilising the waste gas. The blast is blown at a temperature of 900° to 1100°, according to the quality of the iron made. The consumption of coke averages 1 ton per ton of pig-iron made. The great bulk of the coke is supplied to the company under a five-years' contract with Messrs. Joseph Pease and Partners, of Darlington, at a price which would have been considered ruinously low at this time last year; but a large quantity of fuel is also taken from the Wigan district, supplied by R. Parry and Co., of the Kirkless Colliery, and other firms.

The mechanical arrangements attached to the blast-furnaces are, almost without exception, of the most perfect and modern kind. The blast is heated in Cowper's stoves, an iron covered dome-shaped

structure that is now frequently to be met with in the North of England, and which were brought into practical operation by Mr. Charles Cochran, of the Ormesby Ironworks, Middlesbrough. Another form of stove used for these furnaces, and of which we heard quite as good an account as we did of Cowper's, is on a principle patented by Mr. John Gjers, of the Ayresome Ironworks, Middlesbrough, and the speciality consists in the gas-burner, which was first applied by Mr. Gjers to No. 1 furnace at Ormesby, when he was engineer of these works, the stove otherwise being so familiar in its constructive arrangements that some engineers are disposed to withhold from Mr. Gjers any credit in its design. There are six inclined plane hoists, each worked by a special beam-engine, and one hoist on the principle patented by Messrs. Head and Wrightson, of the Teesdale Ironworks, South Stockton. The boilers are partly of the ordinary Cornish kind, and partly Howard's patent boilers. About the works, as a whole, there are 31 Cornish boilers, eight of them being fired on the patent system of T. and T. Vicars, of Liverpool. There are 13 Howard boilers fired on the same principle, and five others in the steelworks fired in the usual way. The Cornish boilers are each 36 ft. long, and 5 ft. 6 in. in diameter.

The engines that supply the blast to the furnaces are in some particulars the most remarkable features of the works. As nearly as can be estimated the total power of all the engines about the works is equal to that of 4000 horses. Eighteen of them are built on the grasshopper principle, with a beam suspended from the centre. Of this large number ten are in one building, and eight in another, the former being the largest engine-house that most of the members had ever seen, and we should imagine it has few rivals in the world. All the engines are made by Parry and Sons, of Bilston. Another type of engine used for the blast-furnaces is the ordinary beam, with double-acting high-pressure steam cylinders, 48 in. in diameter, and 9-ft. stroke, the blowing cylinder having a diameter of 72 inches. There is a pair of these beam-engines coupled in one engine-house—the first erected on the works—and they are doing their duty today as well as ever. A pair of new engines, on Adamson's steeple principle, is now being fitted up by Galloway, of Manchester. They have high-pressure blowing cylinders 36 in. in diameter, and a stroke of 5 ft. The engines that work the hoists are all of the same kind, having a cylinder 16 in. in diameter, and a stroke of 2 feet. They are excellent, serviceable engines of their kind. The whole of the engines are in a line behind the blast-furnaces, with the exception of No. 1 blast-engine, which is placed at one end of the row. The exhaust and supply-valves of the engine are worked on the equilibrium principle, with eccentric cams, which fall suddenly when the end of the stroke is reached. These engines work at a pressure of 3 to 4 lbs., but the engines in the steelworks are worked at a pressure of about 20 lbs. In the engine-houses containing the hoists engines there are two different kinds of indicators to mark the passage of the materials on the hoist. One is an ordinary dial, above which a bell is placed, which is rung when the engine is required to stop or go on, and the other is the more common indicator, about 4 ft. long, which shows at what particular part of the hoist the cages are situated.

The mode of casting the pigs at these works differs very little from that pursued elsewhere. A cast takes place every six hours, and the men work eight-hour shifts, being four hours shorter than the blast-furnaces in the Cleveland district. It is estimated that 25 men are required for each furnace, including ore-fillers, coke-fillers, slagmen, and keepers. Ordinary loam is used for casting purposes. There are 30 pigs in a bed, and 10 to 12 in a cast. From the blast-furnaces to the extremity of the pig-bed is a distance of 70 ft., and along a wall built against the end of the pig-bed there are sidings separating the pig-beds from the filling sheds, into which the raw materials are conveyed for the purpose of being elevated to the top of the furnaces. The pigs are generally a good deal larger than those made in either Cleveland, Wales, or Scotland, many of them (and especially those used for Bessemer steel, as opposed to foundry purposes) being 4 ft. in length. These large pigs are broken up on the pig-bed, after they become cold, to show their fracture, and so demonstrate that their quality is up to the mark. After undergoing this process they are conveyed to the pig-yard, where they are stored. The mode of storing is rather peculiar. The first casting of the week is distributed over a space of from 100 to 200 yards in length. Above this the next casting is placed in the same manner, and so on until the end of the week, when the iron is taken away in such a manner as to give the average of a whole week in the charge placed in the converter. Much of the success of the Barrow Company in being always able to produce a good uniform quality of steel is attributed to this simple mode of working, Mr. Smith having stated in the course of a discussion on the direct process that they made an effort not to have more than 3 or 4 cwt. of any particular cast put into the converter at one time. The slag is allowed to run into boxes fitted with movable sides, and is then carried off in a solid state to be deposited in the Walney channel. Most of the land on which the Barrow Works now stand has been reclaimed from the channel. An excavation made half-way along the line of furnaces showed visitors to the works that for at least a depth of 15 ft. there was a foundation of waste vitreous matter, than which experience has proved it is impossible to get a better basis for blast-furnaces. With reference to the ironworks, it only remains to be added that the smoke is conveyed by underground flues into five gigantic chimneys adjoining the furnaces, and that everything is done, down to the covering of the boilers with brickwork, to prevent the radiation of heat, in order that economy may be promoted. The works are capable of producing 6000 tons of pig-iron per week, consume from 5500 to 6000 tons of coke and nearly 3000 tons of coal per week, along with nearly 12,000 tons of iron ore and 3000 tons of limestone.

The steelworks are separated from the ironworks by a space of over 100 yards wide, made up of sidings and filling-sheds. Three immense bays, each 700 ft. in length by about 100 ft. in width, cover the steel department, which contains 18 Bessemer converters, 10 of them having a capacity of 7 tons each, and 8 a capacity of 5 tons each; 12 steam-hammers, by Musgrave and Sons, of Bolton; 15 cupolas, built on Ireland's patent, and each capable of melting 7 tons at a time; 3 rail mills, 1 plate mill, and 1 one merchant mill, 52 of Siemens' gas furnaces for reheating, supplied by 18 retorts just outside the steelworks, 6 hydraulic cranes, supplied with water from a pumping station, situated between the two works. This brief inventory of their contents can, however, convey but a very inadequate idea of the immense capabilities of these splendid works, which it is no exaggeration to pronounce the largest Bessemer steel works in the world. Altogether, the establishment is equal to the production of 3500 tons of steel rails per week, rails being the staple product. The custom here is to roll three-length rails, so as to get three rails with only two crops. This is only one of many ways in which economy is studied. The rail mills are called respectively Nos. 1, 2, and 3. No. 3 rail mill is driven by one of Ramsbottom's engines, and is a reversing mill. The other two rail mills are on the three-high principle, and are actuated by beam engines, made by Hicks, of Bolton. The merchant mill is driven by an ordinary horizontal engine, with a 40-in. cylinder. The rail mill engines work at a pressure of 20 lbs. to the square inch. Every rail and plate before leaving the works is tested by one of Kirkcaldy's testing machines of which, we believe, there are only other two or three at the most in the world. The ingots are cast in groups of eight. A very curious kind of wagon is used for the ironstone, not unlike the tipping wagons used in the construction of railway works.

About 1500 wagons belong to the Barrow Company, but this does not nearly represent the total number in their employment, many of them being supplied by the Furness Iron Company, Messrs. Pease and Partners, of Darlington, and other firms, from whom they draw their supplies. The company own 18 locomotives, eight of them being of 30 tons, and all the wagons and locomotives are made on the premises, large and excellent shops, provided with all the necessary appliances, being built and maintained for that purpose. In fact, it is not too much to say that these locomotive and wagon shops, where we saw in course of construction some large winding-engines for the new collieries that are being opened out in the Barnsley district by the Barrow Company, are equal to the requirements of a goodly sized railway system. The water supply of the works is chiefly obtained from the town reservoirs; but the com-



pany have a reservoir specially for their own use about half a mile from the works.

In the present article it is impossible to do more than glance at the salient features of this colossal creation. To describe fully the Barrow Works would require at least a week's residence on the spot, and the compass of a large volume. Briefly it may be said that they are a noble monument of the energy, skill, and resources that have made Barrow what it is.

#### ON THE TIN DISTRICT IN NEW SOUTH WALES.

SIR.—I send you the following extracts from a letter received by me from a very experienced tin dresser and miner residing in the heart of the tin district in New South Wales:—

"Up to the present time the chief part of the tin has been obtained from alluvial deposits by sluicing or streaming, which has laid bare the backs of a large number of lodes, varying in size from 6 in. to 6 ft. wide, in a few cases only showing tin, although kindly in appearance. Very little has been done in the shape of mining, and, from the small trials that have come under my notice, the lodes generally decrease in size in depth. There are a few mines paying well, and many others working at a great sacrifice. I have seen many places here that would pay well for streaming in England, containing grains of tin varying in size from a small shot to that of a marble, but through the great cost of labour and carriage, and scarcity of water, not many of them can ever pay cost, being from 100 to 200 miles from the nearest railway station. You people at home need not be alarmed about the future quantity of tin raised in this country, as I consider it will be less instead of more. For the past two years there has been a regular tin fever; everyone was tin mining mad, and any man going to Sydney with a good stone of tin could get up a company at a few hours notice. Of course, there were a great many failures—to the ruin of scores—and they are so disgusted with tin mining that if you were to go there now with a block of pure metal, and say you knew of lodes producing it, you could not get a single share taken."

I may add that the writer is a thoroughly reliable practical man, keen of observation, and from the facts given above I really think that we have not much cause to fear that the future supply from the Antipodes will ruin us.

MINE AGENT.

#### SULPHUR IN ICELAND.

SIR.—The letter of "Brimstone," framed with a view to depreciate the value of the Icelandic sulphur products, is couched in a style of special pleading, which leads me to hope that as he charitably attributes to me "perfect good faith," he may also allow that, whatever interest he may have in pyrites or Italian property, there exists, perhaps, room enough on the globe for us both to survive. Some of the exceptions which he takes to my pamphlet are of a very trifling character. I nowhere "imply" that the sulphuric acid used in alkali and manure manufactures is made from the kind of sulphur found in Iceland. My remarks were intended merely to convey a general view of the conditions under which sulphur is found; and the principal objects to which it is devoted. My references to gunpowder and oidium are sufficient to show the general nature of my remarks. That my statistics were stale matters little, as they were true. I am most pleased to find that one claiming "special acquaintance" with the subject admits that if Icelandic sulphur could be introduced at 5s. per ton into England it would supersede pyrites, as this confirms the opinion of several large manufacturers. This is sufficient to show that there is a market for Icelandic sulphur. He is kind enough to attribute to me "deplorable looseness of figures." Of course, it is obvious that the statement of the export of 52,546 tons into England from Italy left the question of the total products of sulphur from Italy entirely open. "Brimstone," who "had not the returns for the year in question before him," might have consulted them more closely. But after sneering at me for my imaginary confusion of the manufacture from pyrites with that from Italian sulphur, he implies that brimstone is not so much used after all. I am, therefore, thankful to him for admitting that the Icelandic sulphur, of course, would have a great advantage. The superiority of any raw material in demand like sulphur is that if it could be sold at a few shillings lower than the market price it would command a ready sale, not only of 52,546 tons, but of a far greater amount. That the supply exists in Iceland I have proved in my pamphlet. "Brimstone's" "special acquaintance" shows the amount of the demand.

In a recent report to the Italian Government, Signor Parodi has given his estimate that the sulphur of Sicily will be exhausted in 50 or 60 years. It behoves us, therefore, to look out for a fresh source of the supply. I am glad that "Brimstone" shows that I understated the amount of the supply of Sicilian sulphur. The difficulties of the working in the Sicilian mines, where the ore is carried to the surface on the backs of boys, as shown by the testimony of a recent correspondent of the Society of Arts, make the case on behalf of Sicilian sulphur quite bad enough, without recognising the fact that its amount is being gradually diminished.

"Brimstone," unlike myself, claims "special acquaintance" with the subject, but he nowhere in his letter indicates the amount or extent to which he predicts his own authority or infallibility.

Either he has a "special acquaintance" with the Iceland sulphur mines, with the mode of manufacture, or with the sale. On the last two points I shall deferentially sit at his feet; but if he has any "special acquaintance" with the Myvatn Sulphur Mines I, for one, shall be glad to receive any further information he will bestow on me. I said nothing about the "natives" in my little pamphlet, as I was under the impression that I was writing on the subject of sulphur, not of anthropology. But the extent of his special acquaintance with the district can be estimated when he speaks of hands being withdrawn (no doubt from the adjacent neighbourhood) into the "desert" from agricultural operations.

"Deplorable looseness of figures" on the part of "Brimstone," perhaps, indicates the amount of his "special acquaintance" with the district. He deliberately speaks of the "rough road, 45 miles in length," from the mines to Húsavík. Whether he counts by geographical or statute miles he does not say, but there is a certain elasticity in his mind which has led him to convert the real distance from Reykjalid to Húsavík (25 geographical miles, according to Captain Burton) into 45 miles. Almost to double the distance, by taking the utmost point of the concession (Frennínámar) as the point de départ is, I submit, an unnecessary exaggeration of the real difficulties of the case. If, however, "Brimstone" had signed his name, we might have awarded him the honour of being the discoverer of a new system of metrical computation.

I may say that his idea of "carts" is far more fantastic than that of Capt. Burton, whose reasonable proposal of sledges is based on the Canadian experience of many travellers. During the winter the sulphur can be brought down to the port on sledges, which method is the cheapest known. During the summer it would be conveyed by means of a light tramway, such as is used in ordinary slate quarries or mines.

To read the part of "Brimstone's" letter referring to the snow in Iceland, it might be imagined that the fall was so great as altogether to impede internal communication, whereas in point of fact it is very trifling. If your correspondent, instead of "apprehending," had found out by "intelligent enquiry" the probable amount of freight from Iceland, he might have arrived at the same result as the eminent shipowner who supplied me with the price of 15s. per ton. The current rate of freight will not allow a higher estimate. Here, again, we have a factor by which to measure "Brimstone's" "special acquaintance" with the subject.

I am inclined to think, as I have stated in my pamphlet, that I have overstated the amount of cost of transport, which, therefore, is so much in favour of the Iceland mines.

Your correspondent, by the substitution of the word "scientific" for "technical," conveys a meaning to his assumed superiority over me in "special acquaintance" to which I must demur. With regard, however, to the expression which I used respecting the purity of flowers of sulphur, I merely alluded to the commercial and practical purity of the substance in question. I give "Brimstone" the full benefit of the "traces" of "carburetted hydrogen." If he had read

more carefully the quotation from Richardson and Watts he would have seen that it was given as a mere quotation, and that I "adopted" no "teaching." I quite agree with him, that these questions are of minor importance. The subject of interest is—Do we want brimstone? Shall we not get it cheaper in Iceland than elsewhere? These questions are so grave that we may safely leave the public to judge for themselves between the statements of distinguished Icelandic travellers and the assertions of those whose "special acquaintance" with the subject lead them to attempt to depreciate an industry which may be alike productive to English and Icelandic enterprise.

C. CARTER BLAKE.

#### SULPHUR IN ICELAND.

SIR.—Your correspondent, "Brimstone," can hardly have spent a winter in the sulphur mines of Iceland, for if he had he would not be "supposing" this or that, without the slightest attempt at proving his conjectures. One of his suppositions is that the working of the mines is possible only during the time when the Icelanders are engaged in agricultural operations. These agricultural operations consist in cutting grass for winter fodder. The season for this work is called hay-making season (heyannir), and never lasts longer than from the middle of July to the middle of September. From the beginning of May, to the middle of October we in Iceland count upon the ground being free from frost and snow, and this gives three months and a-half outside the hay-making season for outdoor work—digging, and such things. I have here stated the nearest average, but I remember many years when we had neither snow nor frost till after Christmas, and also several years when the ground was free from frost in April. This is, however, of no great importance for the working of the sulphur mines, because they can be worked throughout the winter. The reason is that the heat of the mines keeps them free from frost and snow. The heat of the northern mines was found at their last examination, in 1871, to be 164° Fahr. As a proof of my statement that the mines may be worked throughout the winter, I may mention the fact that the southern mines were worked in January and February, 1869, and the silica mines at Reykjanæs were worked in December and January, 1872-3. Both at the sulphur mines and the silica mines the men worked from five to six hours per day during the darkest months of the year, the very shortest day being in Iceland five hours. About the middle of March the day has reached the same length in Iceland as the day in England, and after that the days grow rapidly longer till about the beginning of May, when there is continual daylight till the end of the month of July.

Your correspondent seems further to think that it will be nearly impossible to obtain labourers in Iceland to work the mines. Now, we know that this has not been the case with the southern mines, for men were found to work in them even during February, which is the busiest fishing season in those parts. In the districts near the northern mines there is no fishing at all, and the people would be glad to get some work during all parts of the year, except, perhaps, during the hay-making season. That this labour would not be very expensive we see from the fact that the men in the southern mines worked for from 3s. 6d. to 6d. per hour.

The other parts of your correspondent's letter I shall leave to themselves. For I merely wanted to correct the erroneous statements contained in it concerning Icelandic matters. JÓN A. HJALTALIN.

Advocate's Library, Edinburgh, Sept. 7.

#### COAL MINING IN ITALY—THE SASSO FORTE COLLIERIES COMPANY.

SIR.—A "Large Shareholder's" sneers at myself I totally disregard, and I will not notice them, further than to state that they are altogether untrue. I do not charge your correspondent with wilful untruth, but he evidently has been greatly misled by some party or parties, whose interest it is that the truth should not be known, and who as they "live in glass houses will do wisely not to cast stones," or get others to do it for them. With regard to my right to the title of Mining Engineer I can, if required, establish as good a right to it as any gentleman following that profession in England, and can produce ample certificates to that effect. I think his letter "looks malicious and vindictive" in dealing in personalities which have no connection with a great public question like this. His statement that I had not "sent a list of these questions to the board" I will describe in my own happy and gentlemanly terms as being "utterly untrue." My solicitor can prove that I forwarded to him on Aug. 13 a list of these questions to be forwarded to the board, and I afterwards forwarded a copy of the same to each of the directors whose address I had. I believe that the directors, as English gentlemen, would willingly acquit me of the charge of writing "maliciously or vindictively" against the company. If I have erred at all it has been in being over zealous for the interests of the company, which I have watched as jealously as though they had been my own. So much for things personal, I will now take a "Large Shareholder's" replies to my questions consecutively.

I.—If the property was legally examined by the legal gentlemen in question, how comes it that the Belletini Brothers still persist in their claims upon this estate, and that the whole of that property upon which the Brunton workings have been made is claimed by Commendatore Ferrari Corbelli; and how is it that I, together with the general manager, have been summoned by that gentleman before the Pretore of Rocca Strada to answer to a charge of having worked upon his property—the identical property upon which Mr. Brunton made his report, and which Mr. Montelli received a notice to cease working upon in the autumn of 1873? and may I ask why (as Mr. Montelli knew that this property was not the company's, as his defence before the tribunal of the Pretore was that he had never sold to this company the property in question) has the company's money been spent for nearly 12 months on a property which the manager knew did not belong to it?

II.—I am glad to learn that the company have no reason to fear any liability for compensation for surface occupation of land, and trust that a "Large Shareholder's" views may prove true, and that certain statements made here may prove false.

III.—If a "Large Shareholder" had derived his information on the subject of land for the road from the proprietors themselves, I think his statement on this point would have been very different. On May 27 last these proprietors, 13 in number, applied to Mr. Wild, Mr. Montelli, and myself for payment of their claims, which came to 5296 lire 18 centesimi, by the valuation of a public surveyor whom they had employed for the purpose. To this may be added 8000 lire due to the man who pitched the road. If required, I will give full particulars of the name and amount due to each proprietor.

IV.—The road at present is not practicable for carts, but for half the money that has been expended upon it a good carriage road might have been made. In my opinion, however, it was highly injudicious on the part of the company to have expended so large an amount (about 30,000 lire) on a road which will be altogether useless to them when the railway is made.

V.—No report of mine has given any approximation to the probable quantity of coal lying under this estate, although I have spoken highly on all occasions (and always will) as to its truly excellent quality. No such explorations as this correspondent mentions have ever been made, although I over and over again impressed upon Montelli and the directors the necessity of making them. No one would rejoice more than myself in finding that Mr. Brunton's views are correct.

VI.—No practical steps have been taken as yet with regard to the laying out of the colliery, nor do I believe it to be possible that in so short a time as two months, even under the best management, a regular output of even 300 tons per week could be secured. Mr. Brunton, the consulting engineer, and the directors know that I was constantly begging for facilities to develop the mines, but I could never get them. Week after week I wrote complaining to the directors and to Montelli that I could not even get timber, owing to Montelli's being deeply in debt to the timber merchant. In spite of my weekly protests, 30 yards together of the workings were allowed to fall in for want of timber, crushing the men beneath it. The cost of the coal raised hitherto has been more than twice what it has been sold for, and this I can prove if required.

VII.—May I enquire of what does the plant and machinery of which your correspondent speaks consist? The whole of the plant and machinery on the ground is not worth 1000.

Under this comes ten minor points:—

1. Regarding the cost of administration in England I have nothing to say: my sole object has been to secure good management in Italy.

2. Knowing the difficulties of the ground, and the high character in their profession of the gentlemen who surveyed it—Mr. Le Neve Foster and Mr. W. A. Brunton—I am glad to find, as I anticipated, that the cost of the railway survey has been very little.

3. I cannot agree with your correspondent as to the cost of the buildings being moderate. One of them has cost, from all accounts, at least seven times more than it ought to, and has already fallen in. Nor can I agree with him as to the possibility of my seeing the accounts. When a recognised officer of the company, and armed with the direct authority of the directors for so doing, I was not permitted to examine those accounts.

(The same remark applies to Nos. 4, 5, 6, 7.)

8. May I suggest that these accounts should be published, and in this manner satisfy the shareholders that the actual cost per ton of the coal at the pit's mouth was only 2s. 6d.

9. The actual cost of carriage of coal from the mines to the railway station was considerably more than 5s. 6d. per ton. If I paid more than twice the amount I would be much within bounds. It has cost more than that from I Gessi to the station, without reckoning the cost on horseback from the mines to I Gessi. The contract price of carting from I Gessi to the railway station was 7 fr. 70 centesimi, and considering that the coal was brought in baskets on horseback from the mines to I Gessi, a distance of about 3 miles, I think I should be under the mark in stating that it could not have cost less than about 16 fr. per ton.

10. Wages must be uncommonly low in Leghorn if an agent and six or seven men could be paid for 14. per week. If your correspondent came out here he would find great occasion to modify his letter. He is stating as facts things of which he can know absolutely nothing. To prove the truthfulness of his or my statements will be a very simple matter. Let the whole accounts be published, so that the shareholders and all parties concerned in the company can be satisfied as to how their money has been dealt with.

VIII.—So far from there having been a profit of 20 fr. or 14 fr. per ton on the coal raised, it has been very much the reverse. If proof be required I can furnish it.

IX.—Regarding the statement published in Mr. Kimber's report, I find, from the officials of the copper company, that no coal of this or any other quality has ever been supplied to them. That gentleman must have been, therefore, wilfully misinformed by some interested party in Italy.

X.—Regarding the Roman railway, I am informed that they are in treaty with the Commendatore Ferrari Corbelli for being supplied with coal from his Castani Mines (which is but little inferior to the Acqua Nera coal) at 22 fr. per ton. It is easy to be seen that they will take this coal in preference to the Acqua Nera coal, for which 30 fr. is charged at the Rocca Strada station.

XI.—I am very glad to hear that "the total amount of the liabilities of the company in Italy is under 10000, and is provided for." The sooner, therefore, they are paid the better it will be for the credit of the company, which has suffered very much of late from delays in payment.

XII.—Needs no comment.

XIII.—The sooner this matter is settled the better.

XIV.—Montelli was summoned some weeks ago by Signor Federico Mori on account of his retaining when paying Mori the men's accounts at the stores 10 per cent. on the total amount of sales (and not on the profits). The affair was arranged by Mori giving him 650 fr. (half profits within 50 fr.) out of the total profit. Not a bad rate of usury for 2000 frs. advanced by Montelli (or the company) to enable him to set up the stores, which 2000 fr., together with the 650 fr., were retained by Montelli at the same time.

XV.—I am very happy to learn (laying aside all personal considerations) that the present manager's duties are at an end; and I trust, in the interest of the company, that the new manager will not in any way be connected with the theatrical profession.

XVI.—If Mr. Wild's visit has only resulted in a full confirmation of the quantity and goodness of the coal (the former of which he knew no more of when he left than when he arrived), that gentleman might have been spared the trouble of coming out to Italy, as Mr. Le Neve Foster, Mr. Brunton, sen., myself, and several other persons, had already expressed our good opinion of it.

XVII.—Upon what grounds does your correspondent base this statement? What amount of hire was paid for the company's horses threshing the corn of Leopold Andreini (the secretary's father), and what hire is paid for their bringing materials to the theatre now being erected at Rocca Tederighi? And what hire has been paid by various persons (whose names I have) for the hire of the company's horses, which they have had in use for months together?

These are only a few out of 50 similar questions that I could ask. Your correspondent states that he has made himself "complete master" of all these questions. If he were out here for a short time, and saw things as they really are, his opinion would be very different. So far from writing vindictively or in malice against the company, my only motive has been to awaken it to its own vital interests.

In conclusion, I have only to say that your correspondent cannot have a more sincere desire for the welfare of the company than I have (even if he has more fully paid up shares than I have). And I trust that under the new management there is a great future in store for it. By the judicious purchase of neighbouring property, and under the management of a man who understands his business, and is allowed to do it, there cannot fail to be a great and prosperous future for it.—Rocca Tederighi, Sept. 3.

W. J. JACOB.

Mining Engineer.

#### MINERALOGY—No. VI.

METALS: THEIR HISTORY, CHEMISTRY, GEOLOGY, ETC.

SIR.—The varieties of iron ore available for the extraction of the metal, *per se*, may be comprised under six heads—red and brown hematites, specular, magnetic (already described, see article No. V.), spathose, and clay ironstone. Other characteristic varieties are found in great abundance, but are prizeable not for the presence of iron so much as for yielding other important elements valuable in the arts. Having in my previous articles dwelt at considerable length upon the character and modes of treatment of the red hematite, or, as frequently designated, anhydrous peroxide of iron, I will now devote my attention to the other species herein enumerated, taking, as second in rotation, the brown hematite, or, as invariably containing water in its composition, the hydrated peroxide. As a general rule this may be regarded as inferior to the red hematite in its yield of metallic iron, but possessing one advantage over it in the presence of manganese. In colour, as the name implies, it is invariably brown, varying considerably in its shades, but dark-brown decidedly preponderating. Owing to the prevalence of both sulphur and phosphoric acid in many varieties, the ore demands the most jealous attention of the analyst in its examination, and of equal importance, in a commercial point of view, is the determination of its combined water, varying, as it does, from 8 to 15 per cent., together with its silica, not unfrequently to the extent of from 6 to 8 per cent. In this class must also be included the numerous shades of ochre, amber, and the brown and yellow clay ironstone. However, it possesses the redeeming quality, when smelted with charcoal, of yielding excellent steel, and when free from obnoxious elements, as is frequently the case, forming good and reliable cast iron.

When iron ores exhibit a redundancy of silica in their composition it becomes requisite to employ an excess of lime in their reduction, in order to vitrify the earthy particles, and facilitate the reformation of glass, which as slag remains on the surface of the reduced metal. It rarely happens that the brown hematite is entirely free from manganese, though compared with some classes of spathose ore the proportion is very small. This embraces bog ironstone, more generally valueless for the manufacture of iron when great strength of the product is demanded, not so much from the low percentage of the metal as the presence of phosphoric acid and sul-



phur, the most obnoxious elements with which iron can be associated. Still there are numerous purposes to which bog iron may be advantageously applied, such as the manufacture of what are popularly known as Berlin ornaments, and other articles which do not require much strength. In other words, those that please the eye rather than constructed for rough usage. It possesses the advantage of being readily smelted, is very fusible, and easily melted. Bog iron produces a metal very thin, and congeals very slowly. Ireland is the country which produces this species of ore most extensively, unless we make an exception of the vast morasses of Prussia. Heat renders bog iron exceedingly magnetic, a property as readily destroyed on cooling. Amidst the varieties I have had occasion to examine one from the neighbourhood of Skibbereen, in the South of Ireland, gave me of peroxide of iron, 55=metallic iron, 38.5; oxide of manganese, 2.5; water, 21; phosphoric acid, 1.65; silica, 17 per cent. The late Sir R. Kane remarks, in his excellent work on the industrial resources of Ireland, "I have not been able to ascertain the extent to which the ore of iron may exist within our bogs, nor do I consider it a question of much importance, as ores of much richer character, and yielding a pure metal, are so abundant as to render bog iron merely an object of curiosity." Still that highly metalliferous portion of the British Empire is fruitful beyond conception in the richest varieties of iron ores, with every facility for turning them to good account, and let the proprietors of the soil and political economists ponder over the enormous wealth and resources of national industry and prosperity which must inevitably flow from the concomitants of iron furnaces, utilisation of peat as an unexceptionable source of fuel, drainage of the land, and the reclamation of soil, to say nothing of the advancement of the sanitary condition of the population, who would thus rid themselves of dangerous miasma, the invidious source of numerous ailments to which "human flesh is heir," and then turn their attention to the development of Ireland's metalliferous resources as a grand and inexhaustible means of raising the character morally, intellectually, and industriously, of her peasantry, and thus destroy the hydra-headed incubus now preying upon her vitals.

Laboratory and Assay Office, 25, Finsbury-place, Sept. 10.

THE ROYAL SCHOOL OF MINES, LONDON.

SIR.—I have read with interest your article in last week's Journal on the Royal School of Mines, London, and believe "it would be of immense pecuniary advantage to Cornish miners to possess the scientific knowledge obtainable by pursuing the course of study forming the curriculum of" that school, but, unfortunately, as you truly observe, "there are really few practical mine agents who have either the time or money at disposal to attend the School."

As a mine agent, I should greatly rejoice at having an opportunity to study for two or three years at the School of Mines, but as this in my case—like that of many others—is impossible, I heartily wish the courses of lectures on mining, mineralogy, and geology could be placed within the reach of those who, like myself, have a thirst for scientific knowledge, but who have not the privilege of attending the lectures.

You have often, Sir, done us (mining men) good service by publishing in the Journal a synopsis of the lectures on mining, &c., and I trust you will again find space for abstracts of the forthcoming lectures on mining, geology, &c. If I am rightly informed, the lectures are not published, except in the abstract form in which you sometimes give them. I wish they were, and this, I believe, is the feeling of many.—Sept. 7.

A MINE AGENT.

TO THE LANDLORDS OF CORNWALL.

SIR.—It affords me pleasure to submit to your consideration at the present time, when the question of lessened dues or royalties is being discussed, the views of the late Mr. Nicholas Ennor on the non-dividend mines surrounding the granite hills of Camborne, Illogan, and Redruth, as published by him in a pamphlet about twelve years ago. They are alike terse, practical, and instructive, and it would prove highly advantageous to capitalists if before they embarked into popular market schemes, they made a rule of consulting practical authorities. It is very evident that Mr. Ennor was a useful man in his day, and if one-tenth of his sound commonsense was possessed by the brokers and promoters of mines in London we should hear less of disappointments in Cornish mining, and probably secure threefold the prizes that now spring from such undertakings when under more practical auspices they became introduced to public notice. That there are good mines in Cornwall there can be no question or doubt entertained, and it is equally certain that two-thirds of those quoted in your Journal ought to be wound-up—hence the value of practical data and intelligence in the selection. To the keen and earnest disciple of the science of investments Cornish mining presents a profitable field for the employment of capital, while to the careless and indiscriminate purchaser no pursuit is so beset with quicksands and dangers. A good mine requires no puffing, while all the persuasive eloquence of (a second) Demosthenes cannot render a bad mine palatable or acceptable to the unfortunate adventurer. Mining, like every other pursuit, requires earnest attention and close investigation, and with their aid no home industry pays better or offers such tempting inducements to capitalists. Mr. Ennor observed:—

Mines paid well fifty years ago, when worked by country gentlemen and merchants, and managed by them. . . . I have no doubt but mines well selected by honest practical men, and fairly managed, would pay well; then the question arises as to why they do not pay? I say that half the mines in the Journal paying calls are of such a character that they never will pay, and should have been abandoned years since.

Camborne Consols: outlay and interest, 32,000l. Were I a shareholder it is not unlikely I should forfeit my shares.—Camborne Vein and Wheal Frances: outlay and interest, 80,000l. Can such mines ever pay?—Carn Camborne: 16,000l. What is its depth or prospects? They should have discovered for this money something more than the old adage, "Go deeper, and find the ore."—Conduffor: 32,000l. This appears a large sum spent. I have long thought it to be managed quietly and easily. The question is, will its prospects warrant further outlay?—Cook's Kitchen: outlay and interest, 80,000l. I do not believe that this mine will ever pay interest for money expended.—Copper Hill: 50,000l. Where is there any prospect in this mine of paying it back? It is a folly to spend a guinea to get a sovereign. East Basset: outlay and five years' interest, 20,000l. What are its good points? I said it would prove a sinking fund mine when I first saw it. Was I right?—East Grenville: outlay and seven years' interest, 28,000l. What are its prospects? I fear not sufficient to warrant a further outlay. Wheal Grenville: outlay, 54,000l. The reports on the last two mines are said to be extra fair in their reports. From what I have seen of them I should say they will not provide salt from profits for many days' dinner.—East Topley: outlay and interest, 39,000l. Might I venture to give a hint to wind it up.—Grampian and St. Aubyn: 44,000l. This mine has many lodes, and when sold warranted a fair outlay. I fear its chances are now all but gone.—Great North Downs: 35,400l. This mine requires watching. Report states they have cut a slide; if so it may make a new shoot of ore.—West Seton did not make much ore until under the slides. Slides are the best things that can cross an ore-bearing lode.

Bellebeagle: outlay and seven years' interest, 28,400l. An old mine, not likely to weather the quicksands at the entrance to the sinking funds.—New Treleigh: outlay and interest, 64,000l. Is it in the auction mart, as I think I hear the auctioneer calling out "Going, going, gone."—North Dolcoath: capital and interest, 26,000l. It is time to call in Capt. Charles; let him put his glasses on, and I think he will candidly tell where it is fast going.—North Downs: outlay and interest, 20,000l. Where is the money going? It is time to show off the good points along the elvans backed by samplings.

North Roskear: Captain Joe must have been fortified with an extraordinary store of ingenuity and patience to have stood to such a long fight with the company. The capital and interest are gone into the sinking fund.—North Basset, Wheal Basses, South Frances, and Wheal Buller ought to have fallen into the hands of Quirke Williams, or some other wideawake man who knew when to stop after having pocketed good round sums.—North Crofty: outlay and ten years' interest, 32,000l. Captain Joe has a good deal of tact about him. I notice he is now assisting to keep on this mine. I wish him luck.—Peden-an-drea: capital and interest, 80,000l. This is the third time I have known this mine worked. May I say that I hope the most sanguine man can have, that it will ever see a glimpse of day?—South Carn Brea: outlay, 51,500l.; ten years' interest, 31,000l. This mine has a large lode, and a good adit; but the lode runs in a wrong direction in the mine. It is time to let it rest. The child unborn—tin—may grow there.—South Condarrow: outlay and six years' interest, 28,000l. This mine has often been worked highly; but the money spent is it time for the shareholders to rise early, and well wash their faces, to see clearly what their prospects are. South Crofty: outlay, without interest, 32,500l. It is reported that its constitution is improving. I hope it is the case, and that it will live long enough to return the money spent on it.—St. Day United: outlay, 66,000l. This is as every thing that may have been expected. Show me one of these old re-worked mines that venture to predict that it is all gone. The mine will not now give remuneration in depth. Have they any chance in side lodes?—West Frances: 55,000l. I told Mr. Harvey when I last saw it that it had not a chance except in side lodes. I regard its prospects in depth for tin.—Union: outlay, 31,000l. My advice is to hold it for a general meeting, and earnestly discuss its prospects, and show the shareholders if they have good points to warrant further outlay.

Had the shareholders in the foregoing mines consulted Mr. Ennor

what a large sum of money would have been retained in their hands, instead of being sunk in the working of what results have proved to be hitherto all but worthless undertakings. It is true that the vested interests of Cornwall—i.e., landlords, merchants, executives, and the labour market—have been advantaged to the full extent of the money subscribed, together with the whole of the products, while shareholders have practically sunk all their money. It, therefore, behoves the landlords to remember these facts whenever the question of dues is discussed. Not one of the mines referred to ought to have paid a single shilling dues to the landlords during the past fifteen years. The land destroyed is otherwise fully paid for.

R. TREDINNICK,  
Consulting Mining Engineer, and Dealer in Stocks and Shares.  
43, Bishopsgate-street, London, Sept. 11.

CORNISH MINING.

SIR.—There is no blinking the fact that the mining affairs of Cornwall are in a sad plight, but are matters being mended by the letters that appear from time to time in your and other papers, prophesying the downfall of Cornwall and the utter extermination of all tin mines? I think not. Rather, should we not set about to devise some means by which those bad times may be tided over, and so far relieve the minds and pockets of those who are unable to stand against the heavy demands being made upon their resources, at the same time who have not the ability to offer any opinion as to how their interests can best be protected. With tin at 50l. per ton, it is very clear that but very few, if any, mines can raise, dress, and make marketable any quantity of tin ore at a profit, and my impression is that the committees, or those in charge of the shareholders' interests, should forthwith take into consideration how far they can reduce the heavy monthly expenditure by suspending all operations underground except such points in the mine as may prove advantageous to the adventurers when better times set in.

To carry out a proposition of this kind I am aware that it would necessitate the discharge of many men, but of two evils we must choose the least. It is very evident that if mines are to continue working on the same liberal scale as at present there will be ample employment for the Stannary Court, the official liquidators, and the solicitors for many years to come. My firm belief is that were many mines to resolve not to raise an ounce of tin until that metal improved in price shareholders would act wisely, and benefit by their determination. The costs would be reduced, calls would diminish, and adventurers feel much more satisfied with the expenditure of their money. There would, no doubt, be a bold stand made against this scheme on the part of agents, as they would, no doubt, feel that their pecuniary interest would be affected in consequence, and very properly so, as I should suggest that their salaries should be reduced for the time equivalent to a reduction in the costs.

As things go they are getting the plums, and we unfortunates have to rest content with a bite out of the crust. Again, I venture to say that not one agent in ten has any interest in the mine which he manages, especially of making calls, and consequently his only contribution is his time (or so much of it as he can spare for share dealing), for which he is being well paid. Comparisons are odious, but I think it will be found, as a rule, that the returns of some mines are about the same as when tin was at 90l. per ton; but, as the price is now but 50l., one is justified in assuming that a heavy loss per month is the result.

We all know that the cost of raising tin is just the same at 50l. per ton as it is at 90l. per ton, or vice versa; and unless a corresponding reduction has been made in the working expenses by the suspension of poor ends, &c., the shareholders will have to make up any difference. The practice adopted by some mines of stocking their tin is a grave mistake, and the continual drop by the smelters induces the idea that they are being well punished for their injudicious resolution. It is said there are 1500 tons of tin held back, but this may be, and doubtless is, open to question. Anyhow, be the quantity more or less it will not tend to improve prices, and I fancy bankers who have made advances will soon begin to feel that their security is rather a precarious one. I hope I am sanguine enough to believe that better times will soon come round. In the interim if, as I have suggested, the adventurers will determine to leave their tin underground and reduce costs, we shall be better prepared, when circumstances permit, to advise more vigorous prosecution of the mining resources of the county.

VIATOR.

OLD TALARGOCH MINE.

SIR.—As a new company has been formed for developing this valuable old mine, I may take the opportunity of giving a few facts which will not be uninteresting to intending investors. The mine was originally worked by the ancient Romans, as a proof of which their tools have been found there. The mine is an old historical one of great renown and proven worth, and the present company, or their ancestors, have worked it very successfully for many centuries, during which it has yielded very handsome dividends to its former proprietors until two years ago, when they had the misfortune to become inundated with surface water at a time when nearly every part of the United Kingdom suffered through the heavy floods then prevailing. Not being prepared for so sudden and unexpected a catastrophe, and owing simultaneously to one of their pumps accidentally breaking down, so much damage was done and so much time elapsed before the water could be got out again, that the directors got considerably involved, seeing that they had little or no working capital (for the mine yielded regularly sufficient to work it in ordinary times and pay the shareholders good dividends), and that no call could be made, as the whole of the capital had been called up many years previously, only one call coming within the present century. The capital of the old company was 44,000l., and upon this they have paid average dividends of 10 per cent. for the last 20 years, including the two years just past, during which they have paid nothing, besides spending a very large sum from revenue upon plant, the value of which has been thus increased.

The price of the mine to the new company is 60,000l. (40,000l. in shares, and 20,000l. in cash), a great portion of which is required to pay off the liabilities. The property is considered to be worth more than 100,000l., the area of the sett being about 1000 acres, about 250 only of which has been worked, and that only to about an average depth of 200 yards, but it is intended to go down to 400 yards. The property has been kept in a few private hands up to the present time, and the reason the new company is now being organised is that the old shareholders for the most part have become extinct, only trustees, executors, &c., being left. New blood and additional capital are required, and a new company was considered the readiest means of getting it.—*Anderton's Hotel, Sept. 11.*

H. A.

KINGSTON VALLEY.

SIR.—In the Journal of last week you have made my letter apply to the "Hingston Valley" Mine, whereas it is the "Kingston Valley" which I wrote about. A shareholder found fault with me for stating at the general meeting of the Kingston Valley that the lead ore gave from 26 ozs. to 30 ozs. of silver to the ton, and stated that he was in a position to prove it gave a much larger quantity of silver. I was aware that on assay some of the ore had given 230 ozs. of silver to the ton; but I think it always best to understate rather than to overstate the value of minerals.

The Kingston Valley Mine is opening out in a way to satisfy all the shareholders, and, as in the course of a week or two sales of lead ore will commence, we shall soon have a practical opportunity of judging from the price obtain 1 for the ore what quantity of silver it bears. For myself, I expect, looking to the strong and masterly nature of the lodes and the quantity of silver in the ore, that the Kingston Valley Mine will prove one of the richest mines in the country. D. FORRESTER.

HODBARROW MINING COMPANY.

SIR.—In answer to your correspondent's letter, inserted in last week's Journal, signed "Shareholder," I beg to say that the workings of the last three months resulted in a large profit; that the directors' salaries do not amount to 500l. per quarter; and that the price of iron ore was not so low as 14s. per ton. Thinking it better that such remarks should not be made anonymously, I beg to subscribe myself as—

FRANCIS BARRATT,  
Chairman of the last meeting.

COSTA RICA.—We understand that the Costa Rica Gold Mining Company (Limited), which is now in course of voluntary liquidation, will be reconstructed, in order to carry out the arrangements for the purchase of the Sacramento Mines, so favourably reported on by Capt. Clemes.

Meetings of Public Companies.

CANAL STREET IRONWORKS COMPANY.

The meeting of the shareholders was held on Wednesday, at No. 7, St. Lawrence Pountney Hill, Mr. E. COLLINS, M.P., in the chair. Mr. GEORGE H. PYM (the secretary) read the notice calling the meeting.

The directors, in their report, stated that they felt justified in congratulating the shareholders on the satisfactory result of this the first year's operations of the company since its conversion into a limited joint-stock company. The capital account showed that the sum of 437l. 5s. 6d. was laid out in building; this sum was expended in the erection of a new workshop, which had considerably increased the efficiency of the concern. The sum of 253l. 13s. 10d., which was also charged against capital account, was expended in the purchase of a new slotting machine. Of the remaining items in capital account, the directors considered it only necessary to refer to the sundry debtors account, 4849l. 1s. 9d., the whole of which amount they considered perfectly good, the greater part having been already collected. The balance of revenue account carried to profit showed, after deducting all working charges, a return of about 24 per cent. on the capital of the company. The net balance of profit, after deducting directors' fees, allowed by the Articles of Association, and writing off 312l. 7s. 2d., which covered all charges whatsoever connected with the conversion of the business into a joint-stock company (including a claim of 125l. 14s. 2d. paid Mr. J. Beattie, late London agent of the company) amounted to 3007l. 13s., out of which sum the directors recommended that a dividend at the rate of 5 per cent. per annum, free of income tax, amounting to 810l., be declared, payable on the 1st of January next, and that the sum of 500l. be taken to a depreciation fund, and the balance of 1697l. 13s. be carried to profit and loss new account.

Mr. H. BETSON (the auditor) then went at some length through the accounts, after which

The CHAIRMAN moved the adoption of the report and accounts. He said this was the first time the report had come before the shareholders in this complete form, and in dealing with it he would point out one or two of the essential points which struck him more particularly. The balance of profit brought from revenue account was 3920l. 0s. 2d., which was a very gratifying and very encouraging profit upon a capital of 16,000l., which was the figure assumed by the proprietors when the private concern was transformed into a joint-stock undertaking. In arriving at that figure with instructions to audit them to the most rigid and severe examination; this Mr. Betson had done, and after the most complete investigation he had brought out the figures as they now stood. The amount of profit mentioned above gave a return of about 24 per cent. on 16,000l. of capital. In the second paragraph in the report it was stated that the capital account showed an addition of 437l. 5s. 6d., which had been expended in building, it having been considered necessary to erect workshops, in order to add to the efficient working of the concern. A second sum of 253l. 13s. 10d. had also been added to capital account, that amount having been expended in the purchase of new machinery to put into the new workshops, which would enable the work to be executed in a better and more satisfactory manner than before. Adding those two amounts just mentioned together, it would be seen that the capital account had practically been increased by about the sum of 690l. Another item appearing in the report was 312l. 7s. 2d., which had been expended for law expenses, and this included the whole expense of turning the concern into a joint-stock company, as well as the amount paid to Mr. J. Beattie; that amount had been written off, and 3007l. 13s. was left as the amount which they had absolutely to deal with. The sum of 500l. had been appropriated for the remuneration of the directors, which was in accordance with the Articles of Association, and which comprised the entire amount which had been paid for the management; and there had been written off 312l. 7s. 2d., which covered all the charges connected with the conversion of the business into a joint-stock company, thus leaving a net balance of 3007l. 13s. The first matter for the shareholders to consider was whether they would accept the recommendation of the board, and agree to the declaration of a dividend at the rate of 5 per cent. per annum, which would absorb 810l., and then it would be for the shareholders further to consider whether they would agree to the further appropriations recommended in the report. Looking at the state of the iron trade during the past six months, when many ironworks had declared no dividend at all, and others had declared very small dividends, he thought the shareholders of this company had every reason to be satisfied with the results which had been obtained.

A short discussion ensued (principally relating to matters of detail), of no public interest whatever, after which the report was adopted.

A dividend at the rate of 5 per cent. per annum was then declared, the sum of 500l. was taken to depreciation fund, and the balance of 1697l. 13s. was carried to profit and loss new account.

Some formal business was then transacted, and the meeting closed with a vote of thanks to the Chairman and managing directors.

THE LONDON COMPANY.

The second annual meeting of shareholders was held at the office of the company, Old Jewry, on Tuesday.

Mr. J. STRATTEN THOMPSON in the chair.

Mr. E. A. HARVEY (the secretary) read the notice convening the meeting.

The report of the directors stated that the profit balance, amounting to the sum of 13,765l. 16s., is to be divided in accordance with the regulations, as follows:—That from the general profit a dividend at the rate of 10 per cent. per annum to be awarded upon the paid-up share capital, and that a bonus of 10s. per share be carried to the share bonus account, the balance of the account (4192l. 16s. 7d.) to be carried to the general reserve fund. That from the profit fund of the first series a bonus of 1l. be carried to the credit of the advance account of each certificate, the balance of account (145l. 15s. 1d.), which includes the amount brought forward from last account, 58l. 6s. 7d.) to be carried forward to the next account. That from the profit fund of the second series (which includes 123l. 11s. 1d. brought forward from last account) a bonus of 15s. be carried to the advance account of each certificate, that the sum of 500l. be placed to reserve, and the balance (27l. 5s. 7d.) be carried forward to next account. That from the profit fund of the third series (which includes 143l. 5s. 3d. brought forward from last account) a bonus of 16s. be carried to the advance account of each certificate, that the sum of 1700l. be placed to reserve, and that the balance (348l. 8s. 9d.) be carried to next account. It is proposed to write off the sum of 57l. 4s. from furniture account, and debit the general reserve fund account with the same. The directors much regret the death of their colleague, Mr. J. R. Stebbing. In accordance with the Articles of Association, they have filled the vacancy by the election of Mr. F. Cheeswright. They have also elected Messrs. S. H. Emmens and Mr. J. F. B. Firth to seats at the board. They regret to announce that Mr. Cheeswright has since resigned in consequence of ill-health.

The CHAIRMAN said the report entered so fully into the position of the company that he need only move that the report and balance-sheet be received and adopted.—Mr. G. BRIDGER seconded the proposition, which was put and carried unanimously.

Messrs. J. Waddell and Co. were re-appointed auditors. The CHAIRMAN said he should mention that the item of 4945l. 1s. 5d. included interest, discount, and commission paid to agents.

A vote of thanks to the Chairman and directors closed the proceedings.

A meeting of the Certificate Holders was then held.

Mr. STRATTEN THOMPSON in the chair.

The report stated that the certificates issued during the year have been 903; these, with the 4199 issued previously, represent a subscribed capital of 102,040l. Advances have been allotted during the year as follows:—

	BY BALLOT.*	BY APPLICATION.†
First Series	£3100	£2600
Second Series	3200	5000
Third Series	2900	6900

\* Free of interest or premium. † At a premium of 100 per cent. spread over 10 years.

The various advances and securities for the same have had the careful consideration of the directors, and they are pleased to be able to report that no loss has occurred in respect of the same since the commencement of the company's business. The profits realised during the year have amounted to 13,455l. 1s. 1d., this amount, together with 3307l. 2s. 11d. brought forward from last account, making 13,765l. 16s. to be divided. The sum of 6392l. 16s. 7d. has been placed to reserve, the sum of 521l. 9s. 6d. carried forward to the next account, and the following bonuses (in addition to the ordinary 5 per cent. per annum interest) awarded upon the several series of certificates:—First series, 1l. per certificate; second series, 15s. per certificate; third series, 16s. per certificate; these bonuses being placed to the credit of the respective advance accounts. The directors think they may fairly congratulate the certificate holders upon the satisfactory progress of the company, and the trust the members will co-operate with them in using their best endeavours to close the third issue of certificates.

The CHAIRMAN moved that the report be received.

Mr. CARR seconded the proposition.

Mr. GRAY drew attention to a discrepancy of 500l. in the item of advances between the amount stated in the report and in the balance-sheet.

The SECRETARY said that the item referred to an advance that had been made and repaid.

Dr. EMMENS explained that the principal had been lent out and repaid, but as the premium had not been earned it had not been paid; and it appeared to him that Messrs. Waddell had acted correctly in the way they had dealt with the item. That explained the figure in the report.

Mr. MASON suggested that the interest, commission and discount should be set forth in different items, and enquired the amount of the directors' fees?

The CHAIRMAN said the directors' fees were 5 per cent. upon the net profit.

Mr. MASON said it appeared to him the directors were taking 5 per cent. upon profits that would not be realised for 10 years. He strongly advocated the directors being well paid, but he objected to the principle upon which they were paid.

Mr. ZALMANSON said as a certificate-holder he did not object to the amount paid to the directors, but to the principle, which was wrong, because the profits should be written in yearly as receivable.

Dr. EMMENS said the profits were not represented by the amount lent or received, but by the bonds entered into for the full amount. The company received tangible securities for the principal and personal for the premium, and in that way he admitted the profits were realised directly the bonds were signed.

Mr. ZALMANSON thought that some of the certificate-holders should be elected upon the board, and if he were in order he should propose a resolution to that effect. If this were not done it would be commented upon adversely, whereas the company was in a sound and satisfactory position.

The CHAIRMAN said the point raised was one in which the certificate holders had no voice whatever. The Articles of Association provided for the election of directors.

Mr. ZALMANSON thought that as the certificate holders contributed all the funds



they ought not to be ignored, and have no voice at all in the company.—The report was received and adopted.

The CHAIRMAN, in reply to a remark by Mr. Gray, said that the board had no objection whatever to an additional auditor being appointed. As to the board, Dr. Emmens, formerly their consulting actuary, having accepted a seat as director, it was not their intention to fill up the vacancy of consulting actuary, the more especially while Dr. Emmens remained a director.

Upon the proposition of the CHAIRMAN, seconded by Mr. BRIDGER, the auditors, Messrs. Waddell, were re-elected, and Mr. Roe (of Wareham) was appointed additional auditor.

Mr. MASON thought it would be very satisfactory if there was a fixed sum for directors' fees.

The CHAIRMAN said that question was provided for by the Articles of Association; but, at the same time, the matter might be considered at the next board meeting.

Mr. ZALMANSON had understood that Mr. Gray had been nominated as a director, and as Mr. Cheeswright had resigned he suggested that Mr. Gray be elected to the vacancy. Mr. Gray was a very good agent of the company, and did all in his power to promote its welfare.

The CHAIRMAN said the recommendation would be taken into consideration, although it was generally understood it was not the intention to increase the board beyond five.

Upon the proposition of Mr. ZALMANSON, seconded by the CHAIRMAN, it was unanimously resolved that a letter of condolence and sympathy be forwarded to the representatives of the late Mr. Stebbing, who had worked so zealously in the promotion of the company's welfare.

#### A unanimous vote of thanks to the Chairman and directors closed the proceedings.

#### GAULEY KANAWHA COAL COMPANY.

An extraordinary general meeting of shareholders was held at the company's offices, Queen Victoria-street, on Wednesday,

Dr. TROUNCER in the chair.

Mr. A. STUART (the secretary) read the notices convening the meeting, and embodying the special resolutions by which it was proposed to sanction and resolve that the capital of this company be increased by the sum of 20,000*l.*, in 4000 shares of 5*l.* each, such new issue of capital to rank in all respects with the existing preference issue of shares, class A, and to be subject to the terms of the Articles of Association of the company for the time being; to resolve that a fresh clause 2A shall be inserted in the Articles—that a supplemental agreement dated July 15, 1873, made between Messrs. Imboden and Moody and the company, whereby the provisions of the agreement mentioned in the first clause were modified, and a further agreement dated August 28, 1874, made between the same parties, be confirmed, subject to any modifications thereof respectively which may be agreed upon between the parties thereto; and to modify clause 3 and clause 84 of the Articles, which refer to the directors' borrowing powers by preference shares and mortgage debentures.

The directors submitted the report of Mr. J. S. Trotter, their managing director in Virginia, who, at their request, has returned to this country on a short visit. They think, on the whole, the statement is extremely favourable, and they have pleasure in being able to confirm it in every particular. Mr. Trotter states that the grading of the railway was completed in June; the bridging and trestle work are all complete, and the line will be available as soon as it is ballasted and the rails laid. This will take about two months, and the cost will be about 4800*l.*, to which should be added 1000*l.*, the price of a locomotive to carry back the empty trucks. The works on the line are all perfectly substantial, and thoroughly well executed. The actual sum expended on the works up to the present date is 6900*l.* The coal mine was opened, according to the instructions of Prof. Ansted, and in the most successful manner. The seam, 11 ft. thick, proved to be the richer, and with smaller partings than seemed likely from the section at the surface. They are now in nearly 200 yards at the level, and will soon begin to open up rooms for the regular extraction of the coal. About 1200 tons of coal had been got out during this preliminary work. The coal is perfectly steady, and it seems likely that it will be found to incline upwards to right and left in going in. It crops out along the line of railway, and there will be no difficulty in multiplying the entries, so that within a short time any required quantity can be taken out per day. There is practically no limit to the capacity of the mine, there being, as you are aware, over 2000 acres of coal on the property. The whole cost of opening the mine from the commencement has been about 900*l.*, and it will, I judge, about 600*l.* additional capital to put 100 tons per day into the market. The value of the coal got out during this preliminary work is not deducted from the cost of driving. It will be necessary to expend nearly 1000*l.* in additional plant for weighing, screening, and dumping the coal into the railway trucks. Mr. Trotter has brought a sample of the coal from the seam they are at present working to England, and sent a quantity to Richmond and New York. There are two qualities in the Eleven-foot seam now being worked, one (the upper) much harder than the other. The lower, or softer coal, is that in which the entry is driven, and of this there is 8 feet. The upper and harder coal is about 2 feet thick, and will be enabled to be got by them very cheaply. The information with regard to the market for their bituminous coal is based upon the statements made by coal merchants in New York, of long standing in their profession, and vouched for by Prof. Ansted, who, with them, has unbounded faith in the capabilities and superiority of the bituminous coal over all others. He says nothing at present of seams of splint and cannel, varying in thickness from 7 to 10 ft., and for which there is a very great demand, and large profits. Cannel coal from the district sells in New York for over 56*s.* per ton. In New York the present prices of bituminous coal are 2*s.* 7*d.* to 3*s.* per ton. The total cost to the company of the coal delivered at New York is estimated at 1*l.* 6*s.* 7*d.* per ton, so that assuming it sold there at 1*l.* 10*s.* per ton, there will be about 4*s.* 6*d.* per ton profit. On sales at Richmond 4*s.* per ton profit is anticipated. The sale of oak staves leaves a profit of 4*s.* 2*d.* per 1000 ft., and those of yellow poplar a profit to the amount of 1*l.* 16*s.* per 1000 ft. These sales of lumber were made in America, but larger profits can be made by shipping direct to this country. Up to July 1 there had been expended 154,000*l.*, and 8900*l.* further outlay is required; for this the property of the company will be immediately available, and a large return will be secured, without the greater part of which it will be impossible to go into the market for some time. In Mr. Trotter's opinion the company acted wisely in purchasing additional coal lands and constructing a railway, by means of which they can, before many years are over, send 1000 tons per day into the market without incurring additional costs for works, and also enter on a lumber business, the profits of which are 30 per cent., as based upon sales made by him during the current year. He again points out that at present price, and under existing arrangements, they can secure a profit of at least 4*s.* per ton on the coal. If only 100 tons per day are sold, taking 250 working days in the year, the profit is 5000*l.* per annum, being 10 per cent. for 50,000*l.* exclusive of the lumber business. The great Kanawha coal region, about which much has been written, and in which the property is situated, was, until a few months ago, cut off from the Eastern markets, but is now in direct communication by railway with the sea. Within 120 miles of the company's coal mine by railroad there are inexhaustible supplies of iron ore of every description, and abundance of limestone. With the necessary capital they might utilise their waste coal in the manufacture of iron, and also effect a great saving in the freight of the coal to the East by employing the empty coal trucks with return freights to carry iron ore and limestone from the East. He had received in writing from the directors of the Chesapeake and Ohio Railway the most liberal terms with regard to freight. As to the manufacture of iron no country in the world holds out such inducements to English enterprise and capital as Virginia. The climate is perfect, the habits, tastes, and feelings of the people are identical with our own. In many senses it is the "Old Dominion" still, and the Virginians never lose an opportunity of expressing their pride and satisfaction at their connection with the Mother Country.

A sample of the bituminous coal brought over from the company's property in Virginia has been analysed by Mr. W. J. Ward (for Dr. Percy), of the Metallurgical Laboratory of the Royal Society, and the results were—Carbon, 83.31 per cent.; hydrogen, 6.44; oxygen and nitrogen, 6.86; sulphur, 0.74; ash, 2.15; water, 1.40 per cent.—100.00. The percentage results obtained on carbonising were—Coke, 65.99 per cent.; volatile matters, 32.61; water, 1.40 per cent.—100.00.

The CHAIRMAN said: Gentlemen, the chief object of this meeting is to secure your consent to the issue of such additional capital as you will be shown is required to develop one of the finest coal properties ever offered to the British public. Indeed, did I not firmly believe in its intrinsic value as a mine of wealth to the present and future shareholders I should feel a diffidence I do not now acknowledge in presiding over this meeting in the absence of our Chairman—Prof. Ansted—who is unfortunately detained for the present in conducting important mining operations in Greece. To those of you who have diligently studied the amended prospectus issued by the directors, together with Mr. Trotter's letter and the notice of this meeting, I have but little information to give, but will, with your permission, briefly glance at the origin, progress, and prospects of our company. When Prof. Ansted visited the scene of our operations last autumn we were in possession only of the Gauley Mountain estate, which, although equal in value to our expectations, did not present the facilities for opening up at a moderate cost and with an early prospect of success as another property nearer the main line of railway. Prof. Ansted, seeing the desirability of acquiring this second property, called the Hawk's Nest, urged the directors to secure it without delay, and thus began the considerable increase of expenditure beyond our original calculation when the company was first formed. It was then decided a line of railway, over three miles in length, should be constructed, from the level of the most available seam of coal to the main line. This great work, involving considerable engineering skill, has been accomplished and paid for, with the exception of ballast and metal; but while it has absorbed a considerable share of our subscribed capital, we believe it will be found that great economy has been exercised in its construction. Houses, workshops, roads, and saw-mills, mining operations, and lumber trade, will also account for a great deal of the remaining capital, the details of which expenditure the secretary will shortly give you in the balance-sheet, when you will find that after calling up the first issue of 20,000*l.* we shall require something short of another 10,000*l.* to ensure our company the position of a first-class investment for the most timid possessor of capital. Funds being supplied, and a very few months will secure a daily increasing output of coal, and its consignment to markets now open and ready to purchase every ton at a good profit. The Eleven-foot seam, while available for a variety of purposes, is especially adapted for the manufacture of gas. We have had an analysis made of the specimen which is now on the table, proving it to be of surpassing quality in the very small

percentage of sulphur which it contains. We can also after a time, by sinking a shaft reach an abundant supply of cannel and splint coal, both of which descriptions at all times meet with a ready sale at large profits; or we could make a short incline from the present working level to the cannel and splint seams, and so secure at once the three varieties of coal—bituminous, cannel, and splint, at an additional outlay of 6000*l.* Your attention has been called in the prospectus to the operations in the lumber trade, which shows a profit of over 30 per cent. on sales actually made, and which may be developed with more capital to an unlimited extent. Another item of expenditure, the stores, shows a good return of 20 per cent., and gives promise of much greater increase as the works progress. The meeting would have been held earlier, had not the directors been obliged to obtain the sanction of the holders of deferred shares to the issue of the capital we now seek. That difficulty, with many others the directors of a young company have had to contend with, has been removed, and we now appear before you on the broad basis of possessing a splendid property waiting to be developed in order to give such gradually increasing returns as shall make us and our children proud of the name of the Gauley Kanawha Coal Company. The secretary will now read the balance-sheet, after which Mr. Trotter will be happy to reply to any questions respecting the local or general interest of the company. Before sitting down I am very glad to be enabled to inform you that at my request Mr. W. Clark, late engineer to the municipality of Calcutta, has promised to take a seat at our board as director. His previous large experience and high position will, I am confident, be a source of great strength to the interests of the company.

Mr. SHARP (the solicitor) explained, in reply to a shareholder, that this was an extraordinary general meeting, and that, therefore, it was not the time for submitting formal accounts, but those would be forwarded to the shareholders previous to the general meeting, which would be due in about October. An approximate balance had, however, been prepared, he believed, for this meeting, and would give all necessary particulars.

Mr. STUART then read the approximate balance-sheet, which showed that the company had 2208*l.* 7*s.* 10*d.* at their bankers, in addition to 5000*l.*, which had been remitted to America so recently that it had not yet been accounted for.

Mr. E. J. WILSON thought that as the question for the consideration of the present meeting was the raising of additional capital, they ought to have a statement of accounts previously put before them. He did not even know that the approximate statement just read would have been put forward, and had, therefore, prepared a resolution for the adjournment of the meeting until after the general meeting had been held. He did not for a moment doubt the value of the property, but merely wished to know whether there was no data before them to enable them to decide whether they were justified in taking up additional capital, and if so to what extent. It was no answer to say that if he did not subscribe others would, because it was obvious that he might be prejudiced by losing the opportunity to subscribe, yet he ought not to be called upon without having all data before him.

The CHAIRMAN submitted that the proximate accounts before the meeting afforded ample data for enabling the shareholders to decide how far they would subscribe. The position of the directors was this—they had used up all the available capital, and the works would be at a standstill until they could get more, and he could not say that they knew the property best but that, in fact, in it, as were the most willing to supply capital; indeed the directors could get the capital at once if the meeting would give them the necessary authority. If they deferred the question until after the general meeting the business of the company would be seriously interfered with.

Mr. WILSON understood that when authority was given to raise funds at the last meeting that would suffice, and he noticed that the expenditure upon the railway had been double that estimated by Prof. Ansted.

Mr. J. S. TROTTER (the managing director) explained that the railway had been made for a double track instead of for a single one, as was at first anticipated; and although that alteration did not account for the whole difference it had added something to the expenditure. Prof. Ansted had, no doubt, rather understated the cost, yet, considering the difficulty of making an accurate estimate, he thought the error was not very large. They would derive advantage far greater in proportion than the difference of making a single and a double track, as the shareholders would readily understand when they considered the position of their property with regard to those of neighbouring proprietors. He explained by means of plans, sections, and photographs of the works and property the work which had been done, and what it was proposed to do. The plans and sections of the girders and trestle work showed that every precaution had been taken to show the necessary strength and durability, whilst by utilising the materials at hand in the shape of abundance of timber they had been constructed at a merely nominal cost. The length of their railway, which was of 30 in. gauge, was about 3 miles and 100 yards, and it was carried right in to their main level. In the laying out of the mine, he had taken every care to ensure economic working, and no unnecessary loss of coal. At present they were working the 11-ft. seam only, but had two valuable seams—splint and cannel—above which, when the works were more fully opened out, would yield still larger profits. At the 11-ft. seam where their railway entered the mine, the level was driven directly into the mountain, and from that workings were turned out somewhat in the South Yorkshire fashion, though their underground manager was a Staffordshire man. He explained by the diagrams that the working levels were driven out at right angles to the main level, and worked into rooms some 500 ft. long and 30 ft. wide, and between these rooms walls of coal 40 ft. thick were left standing. About a dozen of these rooms formed one panel, and when they had been worked the walls would be worked back, so that no coal whatever would be left. There would be no difficulty in having half-a-dozen of these panels working at one time, and thus almost any quantity of coal could be turned out. But it was not alone the working of their own coal that they would probably derive advantage from having their main level in the position in which it had been placed. The owner of the property on the other side of the mountain had large deposits of coal like themselves, and he thought it probable that he would be able to make an arrangement with him to continue the company's main level into his property, and bring his coal over their railway. The payment of a wayleave of 1*d.* or 2*d.* per ton would be alike advantageous to the company and to the owner of the other property, for if he did not use their line he would have to construct one for himself which would be fully five miles long, and was very likely he would choose the latter alternative. As to the working of the splint and cannel seams, some further progress would be made, but he was doing so simultaneously with the working of the 11-ft. coal, and he proposed to carry out that arrangement as soon as they were prepared. These upper seams would be worked similarly to the plan laid down for the 11-ft. coal, and the coal would be brought down inclines to the mouth of their main level. The advantage of this was obvious; they would obtain all their coal in the best possible condition instead of risking its injury by the possible subsidence resulting from the removal of the 11-ft. coal. As to the accounts, he was quite ready to go into them with Mr. Wilson, although this was not a meeting at which formal accounts could be submitted. He had, however, prepared some preliminary statements of what had been expended and what more was required in the report already sent to the shareholders. They would have no trouble, as the Chairman had told them, to raise money if the shareholders gave the authority, though he must say that the difficulty of obtaining capital now-a-days for any honest undertaking was getting more and more difficult. Their company compared favourably with many others in the small expenses of promotion, hardly amounting to the expenses incurred, and in the price given to the vendors, none of which was in money, but all in deferred shares, which could not participate in any dividend till the preference shareholders got 10 per cent. in money, or, if they were not observed, the company would have a margin of profit was very small, but attention ought to be given to the fact that the statement shows only what is attainable at the present moment, and not looking to the future. Prof. Ansted fully believes, he might add, and has stated so in letters to his friends, that the undertaking cannot fail to return 100 per cent. to the shareholders. It was well known, he thought, that the property had increased very much in value during the last few months. Three years ago property adjoining that of the company was selling at from 83 to 84 per acre; it was now worth 840 or 850 an acre, and it only stood to reason that their must increase in value, even if it did not give any present return for the money invested, which was exceedingly improvable.

The CHAIRMAN remarked that the directors had received no fees, all salaries were extremely low, and everything was carried on so economically that he thought no improvement in that direction could be made.

The Rev. H. W. SMITH did not think there was any doubt as to the value of the property or the manner in which it had been managed, but it was a pity that the first statement had not been realised. It was a mistake to say that the Gauley was navigable. But he certainly thought the company had done the best that could be done under the circumstances.

Mr. HOUGHTON said that the value of the Gauley property had not diminished, and he had no doubt it would be developed as soon the railway was finished. The Gauley, moreover, would soon be made navigable, so that the company would have the full advantage.—Mr. SHARP (the solicitor) explained in reply to a shareholder that the object of the alteration in the Articles was to give the directors power to issue the whole 20,000*l.* instead of 10,000*l.*, power for which they had already.

The CHAIRMAN remarked that he was himself a deferred shareholder, and was quite satisfied to give authority for the issue of more preference shares, yet this was a question upon which the deferred shareholders could with good reason object, unless they saw that it was for the benefit of the company. They had ascertained that the coal will sell as soon as brought into the market, and at immense profit. Their 11-ft. seam was, according to Ansted and others, superior to any other bituminous coal in the market, and the splint and other seams were still more valuable.

Mr. ISAAC BUTCLIFFE then seconded the resolution—"That this meeting sanction and resolve that the capital of this company be increased by the sum of 20,000*l.*, in 4000 shares of 5*l.* each, such new issue of capital to rank in all respect with the existing preference issue of shares, class A, and to be subject to the terms of the Articles of Association of the company for the time being," and it was unanimously carried.

The CHAIRMAN observed that the remaining resolutions were really merely to give legal effect to that which they had just agreed to. The directors would have power to issue the whole 20,000*l.*, and their borrowing powers would be restricted to 2000*l.*, instead of remaining at 10,000*l.*, as it was at present.

Mr. SHARP explained that the right to sell their shares, if they wished to do so, had been ceded to the vendor on condition of the vendors authorising the issue of the additional preferred shares.

Mr. HOUGHTON said that they did not require the whole 20,000*l.* at present, but there was no objection to taking their authority. To Mr. on their own terms would be valuable to the company when they opened up the coal. They would also have a fine opportunity of making first-class iron, and thus utilising their small coal. This iron would cost them but 15*s.* per ton, and would sell at 23*s.*

Mr. WILSON thought they ought to look out for iron lands, but not to expend any money until they were in a much stronger position.—The CHAIRMAN concurred.

Mr. STUART remarked that as to the Gauley property, it was not altogether valueless, for they had expended 1038*l.* upon it, for which they had 1400*l.* worth of lumber.

The CHAIRMAN remarked that at present they could send down lumber cut by

smaller proprietors and realise 30 per cent. profit, and Mr. Trotter proposed that whilst they could do this they should leave their own uncult.

It was then proposed by the CHAIRMAN, seconded by the Rev. H. W. SMITH, and unanimously resolved, that the special resolutions which were embodied in the notices convening the meeting should be passed.

Mr. WILSON had much pleasure in proposing a vote of thanks to the Chairman and directors. He thought the prospects of the property excellent, but there should have been more capital, and more caution in placing estimates before him.

The CHAIRMAN, in acknowledging the vote, reminded the meeting that the Gauley property had not been given up, and would prove of ultimate value. There had been a slightly larger expenditure than had been anticipated, but their difficulties, although there had been many, had been really and practically removed. The proceedings then terminated.

#### GREAT WHEEL VOR UNITED MINING COMPANY.

The quarterly general meeting of shareholders was held at the offices, Gresham House, on Thursday.

Mr. J. O. HANSON in the chair.

Mr. J. J. TRURAN (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The report of the committee of management was read, as follows:—

The committee beg to inform their fellow-adventurers that, in accordance with the intimation made at the last quarterly meeting on June 17, a public sale of the materials not required for working the western ground took place on July 7, and, considering the depressed state of the mining area generally in Cornwall, the prices secured were considered fair. The sale by auction realised about 1825*l.*, exclusive of the amount received for the 85-in. engine and boilers brought into the account in June last. In addition, there remains on hand sundry materials valued at 400*l.*, and three engines with their boilers, the value of which it is difficult to estimate owing to the little demand at present for such engines and the uncertain time they may be on hand. This sale justified the committee in giving immediate intimation to the agents to commence carrying on the operations in accordance with the resolutions of the meeting in March last. Several members of the committee and the pursuer went to Cornwall in order personally to confer with the agents on the spot, and thus obtain as far as possible the best information for laying out this work. The committee hope shortly to hear that the 60-in. engine has commenced pumping water from Edward's shaft, so that dressing operations may be recommenced at the old floors, and on the large quantity of slimes there accumulated. This will enable the company to make small monthly sales of tin, and thus help the cost of working West Metal shaft; the advantage being that the dressing can be carried on simultaneously with the draining of the shaft, from which it is proposed to lay open and work the lodes in the western ground as soon as the drainage shall be sufficiently advanced to enable miners to commence driving. The agents estimate that it will require eight months from this time to drain the water in the bottom of West Metal shaft (say) 70 fms. below the adit, enlarge this shaft from surface to that depth, and fix pitwork, &c., in the same; but it is quite possible that long before that period, and as the water becomes drained from shallower levels, operations on the lodes may be commenced. The committee, therefore, watch with great interest the progress of operations in this shaft. The cost, as will be seen from the accounts this day, has been reduced to a minimum, and it is estimated that the work now in progress can be carried on for an outlay not exceeding 200*l.* per month, including London expenses. The committee, acting on the powers vested in them, selected Mr. Mark E. Marsden, an old shareholder, and one who has been in the habit of attending the quarterly meetings, to fill the vacancy caused by the retirement of Mr. John Divett, and which they feel sure will meet with the approval of the shareholders.

The following is the financial state of the company this day:—

Balance in hand per audited accounts to Aug. 12	£ 249 9 1
Since which date there has been received—	
For sale of plant	300 17 7
Tribute and royalty on tin sold from leavings	24 17 8
Half-year's rent of Treilick mill	7 7 0
Total	£ 482 10 11
And paid—	
Labour pay to July 18	£ 105 10 7
On account, merchants' bills	8 0 0
Sundries, postage, &c.	5 4 2
Balance (cash and bills)	£ 363 16 2
The actual account stands this day as follows:—	
ASSETS—Balance as above	£ 363 16 2
Arrears of call	292 2 6
Materials sold and not yet paid	1858 4 2
Return of income tax	51 11 0
Total	£ 2333 13 10
LIABILITIES—Merchants' bills	£ 933 0 2
Lords' dues	108 18 10
Office expenses, salaries, &c.	77 7 0
Labour pay to Aug. 15	150 18 4
Balance in favour of the mines	£ 1293 9 6

The report of the agent was read, as follows:—

Sept. 9.—I beg to hand you the following report on the present operations and the work done since the last quarterly meeting. We have cut down West Metal shaft from the surface 15 fms. below, and have 3 fms. more to reach the adit level; this we shall complete next week. We have fixed strong timber in the first 8 fms. from the surface, and we are carrying the shaft 13 ft. long by 5 ft. wide. At present the water here is about 2 fms. below the adit; we shall square down the shaft to the water, and commence to fix the pitwork, by which time we shall have the flat-roads ready to work. At Edward's shaft we have sunk the perpendicular 2 fms. below the adit for a fork, and are now engaged fixing plunger-lift; this we shall also complete next week. The water is still 6 ft. below the windrose, and at present rising very slow, so without much rain it may take a week or two more to get up, and then I feel sure we shall not have much supply for a month or two unless we drop a lift a few fathoms, but I should advise waiting a bit before taking such a step. We are getting on favourably in building the bob-loading at Edward's, also with the excavation for the bob at West Metal shaft. The landers are all fixed from Edward's shaft to the stamps floors, so that as soon as the water gets up we shall commence our dressing operations, &c., when monthly sales of tin will be made; the quantity will much depend on the supply of water to the floors. We have weighed off and delivered nearly all the materials purchased at our sale, which has taken a great deal of labour and attention; this being done we shall be able to devote our sole time to the new work we have in hand.—S. B. HARRIS.

The CHAIRMAN said that on the present occasion he had but few remarks to make, because the reports just read from the committee of management and from Capt. Harris had put the shareholders in possession of all the information which it was in the power of the committee to give, but at the same time any point upon which enquiry were made he should only be too glad to give the fullest reply. He was glad to be able to tell them that the arrears of call, which at the time the accounts were made up amounted to 262*l.* (of which 56*l.* had since been paid), might be considered a good asset. They were waiting to hear from Capt. Harris that the water had risen sufficiently at Edward's shaft to enable him to start the engine, so as to send the water to the dressing-floors and commence dressing operations, when small returns of tin would be made to assist the costs. He would not detain them with any further observations, except to say that the committee had not anything more interesting to communicate, but he hoped the time was not far distant when they would be able to give something of a more encouraging character. He then proposed that the accounts as audited be passed and allowed.—Mr. ORTON seconded the proposition.

Upon the proposition of Mr. STEPHENSON, seconded by Mr. HUGHES, the committee of management were re-elected, including Mr. Marsden, who had been previously nominated to fill the vacancy occasioned by the resignation of Mr. Divett.

Mr. STEPHENSON said they were much indebted to those gentlemen for the satisfactory manner in which they continued to conduct the company's affairs, and he hoped that at the next meeting they would be in a position to communicate more encouraging information.

Mr. W. Moates was re-elected auditor.

Mr. STEPHENSON moved that the best thanks of the shareholders be given to the Chairman and committee.

The proposition was seconded, and carried unanimously.

The CHAIRMAN, on behalf of the committee and himself, thanked the shareholders for this renewed mark of confidence, and said he need hardly assure them that every effort would continue to be made to do the best they could for the company.

The proceedings then closed.

#### CWM RICKET AND MAESNANT LEAD MINING COMPANY.

The annual ordinary general meeting of this company was held at the Trewhethen Arms Hotel, Llanidloes, on Friday, the 4th inst. In the unavoidable absence of Mr. Joshua Moss, the Chairman of the directors, Mr. J. TAYLOR presided.

The notice convening the meeting having been read, the Chairman remarked that as each shareholder had been furnished with a printed copy of the directors' report and statement of accounts they might be taken as read, and if any shareholder would propose they be received and adopted, or otherwise, the subject would be open for discussion.

A formal resolution, "That the directors' report and balance-sheet, being satisfactory, be received and adopted," was then proposed, seconded, and carried unanimously.

The following is a copy of the directors' report:—

Since the last general meeting your directors have confined operations at the mine almost exclusively to the driving of a 40 fathom level on the Causter lode, in which runs through the property from a few degrees north to west of north, in order to cut the great Maesnant Central lode, at 40 fms. from surface. Owing to the extreme serpentine course of the causter, and the central lode having



changed its course from 75° east of north to 30°, the point of intersection has not yet been reached. Another important lode, however, has been discovered, which has yielded a considerable quantity of saving stuff. The Caunter lode, which has yielded a considerable quantity of saving stuff. The Caunter lode, which has yielded a considerable quantity of saving stuff. The Caunter lode, which has yielded a considerable quantity of saving stuff.

Your directors have deemed it desirable to hold the general meeting in the neighbourhood of the mine in order that those shareholders who wish to attend may have an opportunity of inspecting the property and obtaining from the agent and reasons for confining operations almost exclusively to driving the 40, and concluded by expressing unbounded confidence in the ultimate success of the undertaking. A mining engineer of great experience had been engaged to inspect the property. His report was very favourable. He advocated intersecting the Maesnant Central lode, which could not be far distant, sinking the shaft 15 fms. deeper, and driving underneath a known course of ore, where he confidently expected the adventurers would be amply rewarded for their outlay.

Messrs. Joshua Moss and Joseph Taylor were re-elected directors, and Mr. Thos. Alfred, F.M.I.A., the auditor. A vote of thanks to the Chairman concluded the business of the company.

#### PERKINS BEACH MINING COMPANY.

The annual meeting of shareholders was held at the offices of the company, Austin Friars, on Wednesday, Mr. WYNN in the chair. Mr. W. J. LIVINGSTON (secretary) read the notice convening the meeting. The report was read, as follows:—

Sept. 7.—Agreeably with your request, I beg to hand you further particulars respecting the above mine, to lay before the general meeting of shareholders, to be held on Wednesday, the 9th inst.:

1.—I beg to say there is no alteration worthy of notice in the driving south-east of the deep adit level under the caunter lode towards the Spare lode; but I have put the men to drive a little more south, so as to intersect it sooner than we should by continuing the driving on the caunter lode, and I fully expect to cut into it shortly.

2.—We have a very kindly lode in the west breast driving west upon the Pump-Sump and Chimney Pipe lode, and some lead in it, quite likely for further improvement. I consider by the bearing of Gwilliam's right lode I have found in driving west of what was termed Gwilliam's rise we shall have to continue the driving of the west breast 19 fms. further before we reach the junction of these two lodes, a good trial, and a very desirable point to arrive at in my view, all in new and unwrought ground.

3.—Gwilliam's lode we have cut to the west of the south cross cut; it is a strong and kindly lode, and we have driven west upon its course below Gwilliam's old workings 5 fathoms, and I am pleased to say there is good ore going down below the level dipping fast west towards the Spare lode. Since our setting-day I have had three men rising up in the backs of the level in the ground we have driven through, where we have had some nice lead, but after this week I shall suspend this and set them to drive on the end west upon the course of the lode, as we have a small rib of lead in the caunter lode, which is a good ground before us, and before this lode is reached, the junction with the pump-sump lode according to its regular bearing as we have driven upon it—a very good trial.

4.—The ground in the cross-cut driving north of Crosse's lode, by No. 1 caunter, is favourable for driving, and in about 9 fathoms driving I expect to cut the Pump-Sump lode in the Green Hill side, and by continuing the cross-cut on further north we shall cross-cut Philip's back lode, that produced good ore in the shallow workings; a very good trial is this, and all in whole and unwrought ground.

5.—The ground in Lawrence's deep adit level cross-cut driving south is favourable for driving, and in about 9 fathoms driving south we shall intersect the great Spare lode, and by continuing the cross-cut on south after the Spare lode be cut for 60 fathoms, I expect the great Tankerville lode will be cut at a back of 60 fathoms, all in whole and unwrought ground. I consider the driving of this deep adit level cross-cut a good trial, and might be the means of opening up a great mine in the western part of the sett, which has hitherto been neglected.

6.—I congratulate you as a body of shareholders of having a most valuable undertaking at Perkins Beach Mine if you will combine together and find the necessary capital to open it up properly, and develop it. I am in no fear but you will be well rewarded in the end for your outlay and perseverance, and wish you every success.

7.—Messrs. Riddell & Co. have about 11 tons of lead ore dressed up in the bin, and about 1 ton on the floors to dress up, and about 2 tons broken underground.

The CHAIRMAN said it was his duty to bring before the shareholders the present position of the company. It had been considered all along that if there had been sufficient capital to develop the mine it would be one of the finest in the county of Shropshire. That was the opinion when the present company acquired it, but he thought it had now gone beyond an opinion, as there could be no doubt if the mine had been properly worked, and the shaft had been sunk 60 or 80 fms., Perkins Beach would now be a very fine mine. It was, however, perfectly useless, and those who were acting with him were of the same opinion, to commence to sink the shaft until sufficient money had been subscribed to finish it, otherwise the money would be thrown away. The capital already expended had not been thrown away, because every lode and every string of lead in that valley and those hills had been developed, and it had been clearly ascertained what course they took, and where would be the best position to sink the shaft to develop the mine. They had gone on carefully, and taken good care the company should not get in debt at any time. There was now about 200l. in hand, with 420l. due to the bank, and there were 12 tons of lead, so that no time should be lost by the shareholders in coming to a decision as to whether the company should be wound-up, or that some course should be adopted to continue operations. As the question was one entirely for the shareholders to decide he would rather like to hear their opinions than express his own, although he might repeat it would be useless to spend any more money unless there was sufficient to develop the mine.

Mr. BOUTREDD fully endorsed all the Chairman had said with regard to the value of the mine. He (Mr. Boutredd) resided in the district, and was acquainted with the mining agents of the surrounding mines, who gave it as their unbiased opinion that Perkins Beach would be one of the finest mines in the whole county of Shropshire, if properly developed by sinking the shaft. It adjoined Snailbeach, the agents of which looked upon Perkins Beach as a most valuable property, unanimously affirming that all that was wanted was to sink the shaft. From what he mentioned last year the money subscribed upon the preference shares was to have been expended for that purpose, but no step had been taken in that direction. He thought it would be better for the directors to suggest the best course to be adopted to get the company out of its present difficulties.

The CHAIRMAN explained that only a portion of the money was subscribed for the preference shares, and it was not deemed advisable to commence to sink the shaft upon promises that shares would be taken.

Mr. BOUTREDD believed that a discovery had been recently made. The CHAIRMAN said that every economy had been used, and a great deal of work had been done, but he would never allow their pay sheets to run beyond a certain amount, and he held a party to go on if there was not money enough in hand to complete the sinking of the shaft to the required depth.

Mr. BRIGGS asked how long the present company had been carrying on operations. Mr. LIVINGSTON: From May, 1870, to the last few months the mine had been proved very much more than previously.

Mr. BOUTREDD said the mine had been developed more the last six months than ever before by the present company, and one of the results had been a discovery of a vein 12 in. wide.

Mr. LITTLE thought the directors had acted very prudently in not allowing the company to get into debt, and enquired the cost of the new shaft.

The CHAIRMAN said it would cost 3000l.

Mr. LITTLE asked if the ground had been driven through?—The CHAIRMAN said that Lawrence's shaft, which had been sunk about 10 fathoms, had been cleared up to see the character of the ground, and an adit level had been driven east and west, both upon the course of the vein and on Lawrence's lode.

Mr. LITTLE said it appeared to be most desirable that an effort should be made to get the necessary additional capital.

Mr. LIVINGSTON said that the manager had selected the site for the new shaft, and everything had been made ready to commence as soon as the capital had been subscribed, so that there would be no waste of time, and there was ample machinery for all purposes.

Mr. BOUTREDD said that the Shropshire mines did not reach their richest until a depth of about 60 fms., and Perkins Beach had not yet reached that depth, but very few mines had returned as much ore under the same difficulties. He did not think it would cost 3000l. to sink the shaft to that depth—60 fathoms.

Mr. LIVINGSTON said the estimate of 3000l. included the removal of the engine and everything in connection with it.

The CHAIRMAN said he should not like to have anything to do with it unless 3000l. were subscribed. He held a heavy stake in the company, and he should not feel inclined to subscribe his proportion unless he knew 3000l. would be at their command to carry out efficiently the proposed work. He then proposed that the report and accounts be received and adopted.

Mr. HULL seconded the proposition, and said it would be advisable to hear the views of the Chairman upon the subject of the future of the company.

The CHAIRMAN said he should recommend the present company to be wound up, and the mine sold to a new company, the shareholders in the present company accepting fully paid shares in the new company. He would go into the new company, and take about the same stake which he now held. He did not see why such a heavy capital hanging over them, whereas if a new company were formed it would be a very profitable one.

Mr. BOUTREDD suggested that 6000 shares of 1l. each should be issued, and

offered to the public at the market value of the shares—12s. 6d. He felt tolerably certain that a large number would be taken up in the locality of the mine.

Mr. LIVINGSTON said they had no power to issue shares at a discount. The report and accounts were received and adopted.

The CHAIRMAN then proposed that an extraordinary general meeting be called for the purpose of considering the present position and affairs of the company, and if so determined, to wind up the company.

Mr. LITTLE seconded the proposition, which was put and carried. A vote of thanks to the Chairman and directors closed the proceedings.

#### WEST BRYN CELYN MINING COMPANY.

The first ordinary meeting of shareholders was held at the offices of the company, Seal-street, Liverpool, on Wednesday.

Mr. JOHN WALKER in the chair.

Mr. THOMAS HUGHES (the secretary) read the notice convening the meeting.

The directors' report was read, as follows:—

In meeting the shareholders at this the first ordinary general meeting of the company, the directors are glad to state that the extent of work done, and the general development of the mine have quite realised their expectations, as several good courses of ore have been laid open in the various ends worked upon, as stated in the prospectus. The first point of importance was to clear out and open the adit level so as to unwater the mine, and this piece of work has been completed for an extent of 440 yards, and is now prepared with train rails, air-pipes, and every convenience for cheap and expeditious working. There has been sunk a new shaft called Alexander's shaft, 60 yards deep, and a new oak-whim and pit-head have been erected complete. The have also been put in ladderways, air-pipes, &c., and the men have driven north and south from said shaft, and discovered some important lodes, from which it is expected that large returns of ore will soon be made. The directors have now decided to erect an engine on the main shaft, which is 60 yards deep, and 30 yards under the adit level, for the purpose of unwatering the mine and opening up the ore ground that had to be abandoned some years ago by the former workers in consequence of an incautiously secured shaft, at a depth of 60 yards, running together. The directors are of opinion that when the mine is unwatered at this point, and the ore ground reached, it will be in a position to bring large quantities of lead to market, and so be able to pay good dividends. Independently of the large amount of work done at the main shaft, and at Alexander's shaft, the directors have added considerably to the development of the mine by opening out Haye's and Simon's shafts, and have made trials on the lodes which satisfy them that good courses of ore will be met with in deep explorations. The directors propose, therefore, to continue the main adit west, to not only drain the western workings, but also to intersect the north and south lode that is known to exist in the sett. The directors have pleasure in stating their belief that this mine will soon prove to be a most successful one, and they assure the shareholders that the greatest economy, with a due regard to efficiency, shall be observed in the speedy development of the mine.

The captain's report was then read, as follows:—

I beg to hand you my report of the work done from the commencement at the above mine, and its present appearances and prospects. The adit level has been re-opened and continued through fresh ground for a distance of about 440 yards; the rails are laid all along from the shaft to the forebreast of the level; and the air pipes are of sufficient size to admit plenty of fresh air for the workmen. The level is of a sufficient size to afford every facility for the development of that part of the mine. In the forebreast of the level there are leaders of ore all through of a very good nature. In the forebreast of the cross-cut north we have just reached the Draw-well joint, which contains a little lead ore and calamine, and there is a constant stream of water running from it. I mean to continue this driving further west, to get under the Draw-well shaft, in which there is a rib of ore, as left by the former workers. We have sunk a sump on the adit level on the north and south lode, near to No. 1 shaft, upon a small leading of ore, which improved very much as we sunk upon it. There is now a rib of steel ore about 8 in. in width, and, as far as I can judge, it is likely to improve, but we could not follow it any deeper owing to the want of water. We have re-opened Alexander's shaft to the bottom, which is about 60 yards in depth. The top of this shaft has been walled for a depth of 15 yards, and the remainder secured with strong timber; and is divided into two compartments, a winding-shaft and footway. There are also air pipes set from top to bottom, and a new oak-whim and pit head, all very strong and complete. From this shaft a trial has been made in the 40 yards level, from which a small quantity of lead ore was obtained, and is now on the bank. We have also driven a cross cut, north from Alexander's shaft, for a distance of 30 yards to Simon's lode, upon which we are driving west; and are getting a nice leading of ore, which keeps improving as we gain ground. We are still continuing the cross-cut north, as I have reason to believe that the Bryn Celyn lode is still further north. We have also a nice rib of ore in the 25 yard level from the north shaft, from which I have got a few cwt. of lead ore, and the vein looks very promising for improvement. We have sunk Haye's shaft to a depth of 30 yards; and have made ladder way and pit head all complete. I expect that the level from Alexander's shaft will drain the whole of this end of the mine, and as there is some good ore left under water I expect that this ground will become profitable. We have also completed the cross-cut to the south lode, but as we did not find any lead ore in it I shifted the men to another portion of the mine, where there are better prospects. We are now preparing the foundation for an engine-house, and have cleared the quarry, and commenced to raise stones, which are very good and convenient to the place. The mine being now so well prepared and opened out, and the leadings of ore in so many parts being ready for work, together with the ore which is now under water, but which will be got at when the engine is erected, lead myself and other of our shareholders to believe that we shall have a lasting and good dividend-paying mine.—JOHN LLOYD.

The CHAIRMAN said that the reports which had just been read gave a most encouraging account of the present appearances and future prospects of the mine. He felt sure that the shareholders would join with him in the conviction that every attention and energy had been displayed by the captain to make the mine a paying concern. There had been several lodes discovered of a most promising character, and he had no doubt that when the new engine is erected, so as to drain the lower workings, they would be able to bring large quantities of ore to market. He would now move that the accounts and balance-sheet, together with the reports represent, be received and passed.—The proposition was seconded by Mr. COTTON, and carried unanimously.

Mr. RICHARDS then gave a description of the mine as it was when he worked there some years ago before the disaster occurred to the shaft, and he said he felt the greatest confidence in the undertaking. He could say that there were undoubtedly thousands of tons of ore in the deep levels, and it only required efficient pumping machinery to enable the men to get at the lead. When he worked at the mine, he had raised about 20 to 30 tons of lead per month, and since then no ore whatever has been raised from this lode for want of the necessary machinery, which he was now glad to learn was about to be erected.

The retiring directors, Messrs. Walker and Coombe, were re-elected for the ensuing year.—It was proposed by Mr. HUGHES, seconded by Mr. COTTON, and carried unanimously, that Mr. Wm. Morton be added to the list of directors.

The CHAIRMAN said that he felt great pleasure in bearing testimony to the able manner in which the affairs of the company had been conducted by Mr. Hughes, who had done his duty to the shareholders of the mine. He was sure that the shareholders might rely that their interests would always receive the earnest care, and he well looked after by their managing director.

Mr. HUGHES, in acknowledging the kind remarks of the Chairman, said that his interest in the mine was a very heavy one, as was likewise that of his friends, and he was very proud to hear from the worthy Chairman that he and the shareholders reposed such confidence in his management. He could only say that he would use his best endeavours to merit that confidence. He felt certain of the early success of the undertaking, and as far as his efforts would tend to bring about this desirable result, he would spare neither time nor attention to further the interests of all concerned. He had great pleasure in referring to the valuable services of the captain, who had ably seconded him in every possible way for the good of the company.

The CAPTAIN then replied to several questions respecting the new workings, appearances of the various lodes, &c., and gave a highly encouraging account of the mine in general.

A vote of thanks to the Chairman terminated the proceedings.

#### EAST BASSET MINING COMPANY.

A meeting of shareholders was held on Thursday, Mr. H. L. PHILLIPS, F.G.S., in the chair.

The CHAIRMAN read the accounts for seven months to the end of June, as follows:—Dr. To balance against mine last year, 3915l.; labour costs for seven months, 2557l.; merchants' bills, 1603l.; total, 8074l.—Cr. By black tin, 295l.; copper ores, 451l.; less dues, 19l. = 757l.—total credits, 7317l. call last account, 3485l.; present debit balance, 3822l. He (the Chairman) said a call of 8l. per share would pay off this liability, and leave about 1000l. to the good.

Capt. PRYOR (the agent) stated that they had recently made a very important discovery at the 50 fm. level at Copper Hill, on a part of the lode left standing by the late agents, and which had apparently been unknown to them, from which they had raised about 100 tons of copper ore, and he was happy to be in a position to state that this lode was now standing in whole ground both above and below where they had seen it, and he believed that large returns of copper ore would soon be made. The tin department was also looking encouraging, and they had a good lode laid open for 30 fms. in length that would yield 50 lbs. of tin per ton of stone.

Mr. HARRIS (of Pool) said he preferred a *viva voce* report as a rule. He was highly pleased at the improved prospects of the mine, and saw no reason why as good a lode should not be made in Copper Hill as they formerly had on the old lode in East Basset. He was not much in favour of prosecuting operations on the tin lode at present, but believed the day would come again when they might have a great tin mine.

The statement of accounts as read was proposed by the CHAIRMAN, and seconded by Mr. HARRIS, and with a call of 8l. per share, were unanimously agreed to. It was also resolved that all shares on which more than one call was due should be declared forfeited at the next meeting of the company, and that the pursuer be instructed to give 14 days' notice to each shareholder in arrears accordingly.

The general report stated that the attention of the agent had lately been principally directed to the development of the copper ground at Copper Hill, where after clearing the 50 for 125 fms. in length east of the shaft, a portion of the lode had been found standing from the bottom of a winze, which on being cut into was found to be 6 ft. wide, and worth for copper ore 75l. per fathom. This discovery is now being opened upon east and west by 12 men, at 6l. per fathom. A rise has also been put up in the back of this level as high as the 40, and the 40 driven east 30 fms. For the whole of this rising and driving the lode had been left standing to the south of the level. Men are now engaged in cutting in at the 60 to intersect the main part of the lode, and all appearance the lode is producing as good quality ore as in the 50, so far as opened out.—Old Lode: The lode in the top of the bank of the 100 east and west of the shaft, is 3 ft. wide, and worth 18l. per fathom for copper; stopping by six men, at 3l. per fathom.

QUEEN'S.—At the meeting on August 6 the directors reported that they had received on all hands encouraging reports of the ultimate success of this mine, mineralogists and practical captains of mines all coinciding in the opinion

that the Buttersfield, contained in the sett, is one of the richest portions of Holywell Common, and all concur in the advisability of sinking the Gladstone shaft to a deeper level. This may readily be effected, and, probably, the operation of sinking may be done without actual cost, as the shaft is sunk on the lode, and may yield lead to pay for sinking, as was the case on a former occasion when sinking the same shaft. By this means the mine would be developed at deeper levels, which all authorities in lead mining consider the best means of efficiently working a mine. The Chairman stated that the ore sold had fetched very good prices, thus proving the quality to be good, and that the vendor's confidence in the property is a point not to be overlooked, as the balance of purchase-money due to him such a sum as will pay a dividend for the first two years of 10 per cent. on the whole of the capital paid up. The report and statement of accounts were considered satisfactory, and the dividend ordered to be paid quarterly. A vote of thanks to the Chairman brought the meeting to a close. The first dividend was paid on Sept. 3.

#### LANESTOSA LEAD AND ZINC MINING COMPANY.

The general meeting of shareholders will be held on Thursday, when the following report will be presented by the directors:—

The directors have now the pleasure of handing you the audited accounts for the year which terminated on June 30 last, also Capt. Gifford's report on the operations carried out since the last annual meeting. The last annual meeting showed that the total expenditure during the year has amounted to 4062l. 2s. 11d. This is an increase on the previous year of 712l. 19s. 7d. The increase in the returns of ore have, however, more than compensated for the increased outlay, as will be seen from the following figures:—Proceeds of ore, 12 months, to June 30, 1873, 915l. 6s. 6d.; ditto, 12 months, to June 30, 1874, 2434l. 2s. 9d. In presenting their report in August of last year the directors, whilst admitting that up to that period the result of the operations had been rather discouraging, stated that there were "still points not to be overlooked, any one of which, when further explored, might open out ore in large quantities." In view of which they recommended the vigorous prosecution of the exploratory works. The shareholders approved that recommendation, and the result of the operations thus carried out has been the discovery in the Mine of Ascension of ore in remunerative quantities, with the prospect of further improvement as the mines are deepened. Anxious to husband the resources of the company as far as possible, the directors, in the autumn of last year, requested Capt. Gifford to suspend operations in those parts of the mines where there was least prospect of getting immediate returns of ore, and to direct his attention principally to the Mine of Ascension.

This mine has since been vigorously worked, and much ore—especially lead ore—has been discovered. The satisfactory feature in this mine is that the lode appears to increase in productiveness as a greater depth is reached. Capt. Gifford is of opinion that this will prove to be characteristic of the lodes in the other mines, so that there is now every encouragement to proceed with their development. In consequence of the disturbed state of the country in the vicinity of the mines, Capt. Gifford has at times found it very difficult to proceed with the mining operations, and for some months he was compelled to suspend the raising of ore altogether. The exploratory works have, however, been continuously carried on. During the recent month of May, June, and July it is estimated that the ore raised has fully covered the working and home expenses, and left some margin for profit. The time has now come when machinery and additional appliances should be provided for working the mine and dressing the ores; and, as some capital will be required for exploratory operations, as well as to replenish the floating capital, the directors estimate that a call of 5s. per share will be necessary. Of this amount 2s. 6d. per share will be required immediately, the other 2s. 6d. per share in a few months hence.

For remainder of Meetings see to-day's Journal.]

A NEW GOLD REGION.—When gruff old Dr. Samuel Johnson poured out the wealth of his imagination and the longest of Latin derivatives into the "History of Rasselas, Prince of Abyssinia," he little thought that the Valley of Happiness, hemmed in by frowning mountains, and isolated from the outer world, which he pictured in Africa would one day be found in the western hemisphere. If the testimony of tourists were taken as to what part of the globe was most prosaic, and where they would least expect to be called upon for an outburst of sentiment, they would be likely to recur to their experiences in our newly-settled West. Yet even there, amid the uncouth life of the frontier, the whippers over camp fires had told for years of a secluded region where white men had never penetrated, where gold, and game, and pastures were abundant, where mountains and hostile Indians barred the way. Wiseracres derided these legends. Expeditions to explore the Black Hills had always been discouraged by our Government, and those that were attempted met determined hostility from the savages, and material obstacles that utterly baffled their curiosity. The facts that have been revealed by General Custer's report on the Black Hills Expedition transcend these legends. The prose of reality, even in official utterances, surpasses the stories that were ascribed to fancy. The details of this interesting discovery read like a chapter of romance. The explorers, skirting the hitherto impenetrable boundary, find access by following a water-course, but are stopped by the narrowness of the canyon. Suddenly a gap is discovered in the rocky wall, and the adventurers press within the charmed circle, where thousands of verdant acres are spread before the eyes weary of the desolation of the outside plains. Rich pasturage, pure cold water, "stone, wood, fuel, and lumber sufficient for all time to come," though involving some repetition as thus enumerated, certainly present an attractive picture. Here is land fit for cultivating all cereals except, perhaps, corn, and a climate that guarantees the success of the husbandman. But far more attractive than even this catalogue of surface products are the indications of the soil. Iron, plumbago, and gypsum are there in abundance. Gold—so the official report tells us—is found in the very roots of the grass, and thence downward, in profitable quantity, even to a depth of 8 ft. of who have had no experience in mining find gold without expending time or labour. We hear now nothing about Indian treaties and the sacredness of the reservation. All through the border towns the excitement of the news is spreading. It is "gold and gold and gold without end, and visions of gold in futuro." Prompt measures will be necessary on the part of Government in reference to the incoming throng of gold seekers, to prevent or legalise their incursion, and, if necessary, to protect them against hostile savages.—*New York Tribune*, Aug. 24.

COAL BORING OPERATIONS IN INDIA.—The Indian papers contain the following interesting particulars of coal-boring operations in the Nizam's dominions:—"On the right bank of the Godavary, some eight or ten miles below the town of Badrachellum, and about four miles from the bank of the river, extensive boring operations have been carried on under the supervision of Mr. Heenan, superintendent of the Nizam's coal fields. In one bore-hole a good seam of coal was struck at about 320 ft. from the surface, also two thinner seams at a lesser depth of a fair quality of coal. The Singareeny coal field has not been explored by borings, and it is found to contain four very extensive seams, which are superior in quality to any yet found in India. In one of the borings the lower seam was found to be over 40 ft. in thickness. Mr. Heenan has put a shaft down to the upper seam, and a large quantity of coal has been excavated, which is on its way to Bombay in order to be compared with English coal. Borings have also been put down about midway between Singareeny and the Godavary, where in every probability coal will be found. A very close examination has been made by Mr. Taylor, coal viewer to H.H. the Nizam's Government, and Mr. Heenan, of the carboniferous formations lying in this district, and several places have been found where in every likelihood large deposits of coal will be discovered."

VALUABLE AND ECONOMIC LUBRICANT.—The subjoined communication will be of interest to all users of machinery, since the importance of having a really good lubricating oil can scarcely be over estimated:—

SIR,—We see a paragraph in last week's Journal respecting a new oil for lubricating. We think you have rather gone beyond the limits of what is strictly correct in saying this oil is considerably cheaper than any other oil that approaches it in quality. We have for seven years, been sole agents in this country for a real American natural lubricating oil, and hold certificates from some of the leading houses in this country and the Continent, to the effect that it is a lubricator equal to sperm oil, lard oil, or Galipoli oil, even for speeds of 3000 revolutions per minute, while there is a saving in price of nearly 40 per cent.; and, so far, nothing has been introduced that offers the same advantages of price and quality. We are prepared to appoint really efficient agents in all districts.

Liverpool, Aug. 24.

ALEX. SPARROW AND CO.

IRON AND STEEL PUDDLING-FURNACES.—The invention of Messrs. S. and C. NEWTON, of West Bromwich, consists in forming in the bed or bed-plates of the furnace a continuous channel by preference of a zig-zag figure, through which a continuous stream of water, by its passing, which the cooling effect keeps the bed of the furnace at so low a temperature that it suffers little injury from the heat of the furnace. The cast-iron plates forming the bed have imbedded in them wrought iron pipes of a U figure; or pipe-like cavities of the same figure are made in the plates by the casting process. The ends of the pipes or cavities are connected together by junction pieces, so as to form a continuous channel in the bed of the furnace for the cooling water to pass through.

ARTIFICIAL FUEL.—Lieut.-Col. A. F. CORBETT, of Doncaster, proposes a fuel composed of 5 lbs. weight of powdered charcoal, 6 lbs. clay or clay earth, 1 gallon of liquor into which 6 or 7 lbs. dried cattle dung or peat have been stirred. These ingredients are added and mixed separately and formed into a stiff paste mortar-like, and shaped by hand or moulded and dried.

GAS AND GAS-MAKING APPARATUS.—Mr. JOHN SOMERVILLE, of Dublin, proposes to carbonise coal or other material in much larger masses than is usually the case, in apparatus specially designed for the purpose, the said apparatus consisting of retorts or ovens made of fire clay or brick, about 20 feet long, 10 feet high, and 18 inches wide at bottom, but tapering to 1 foot wide at the top, with doors to open both at the bottom and the top, those at the bottom being so constructed as to be entirely removable if necessary on a frame or wagon, constructed so to receive the coke when the charge is withdrawn. The retorts or ovens are set side by side upon arches that will admit of wagons or trucks passing beneath the retorts. The furnaces are placed between the retorts, and are fed with fuel from the top, and the ash pit is made sloping, so that clinker or ashes may slide down into a receiver, from which it may be removed from time to time. The fire-bars are made with recesses for the insertion of fire-brick, which may be removed when requiring renewal. The exit pipe for the gas is at or near the top of each retort, the said pipe being led into a chamber, which also contains one extremity of the pipe leading to the condensers. The passage from one pipe to the other is sealed by a diaphragm which is placed between them, and dips into water contained in the chamber. From the chamber just mentioned the gas passes on to the condenser, consisting of a series of pipes of, by preference, about 3 in. or 4 in. in diameter, but admitting of variation to suit the requirements of the works. These pipes are connected at each end with a chamber, the gas being made to pass from chamber to chamber in a zig-zag direction, together with the products of condensation, and at each chamber are received in bulk and broken up into separate streams, and again collected in bulk until the end. The retorts or chambers are charged with coal from a wagon or wagons, made to run along a tramway above them, and when charged, the lower doors or bottom being previously secured, the upper doors are closed and the coal left to distil, the gas passing off by the exit pipe to the condensers as previously described. The coals may be supplied to the wagons by a hoist or any suitable contrivance.



## FOREIGN MINING AND METALLURGY.

There has been no very striking feature in the Belgian iron trade during the last few days. At a recent adjudication for old rails at La Louvière the lowest tender was submitted by M. Boucquériau, who offered to exchange new rails for old rails (Vignoles) at the rate of 1,000 ton for 2,015 tons. This would make the value of old rails about 4l. 6s. 6d. per ton, estimating the value of new rails at 8l. 16s. per ton. The Zone Forges Company tendered for three lots, at about 4l. 2s. per ton for the old rails. The house of Carterwyck, of Antwerp, proposed to take them upon terms equivalent to 4l. 2s. 6d. per ton. The difference in the offers made was not very material, and may be accepted as an indication of a return of confidence. Although no great amount of business has been passing in iron in Belgium, prices have, nevertheless, been maintained, thanks to an influx of small orders. Some attention is being devoted to contracts which are about to be let for the construction of railway plant for Roumania. This attention to Roumanian requirements is probably attributable to the fact that the Belgian railway companies, which possess very extensive repairing shops, only apply to private industry for renewals, which are insufficient to afford employment to the numerous workshops of Belgium. New lines have become scarce and rare in Belgium, and those which are constructed belong, at least by alliance, to some other large company which has its own workshops. In France, Belgian rolling stock manufacturers might, perhaps, find something to do, if Customs duties and transport expenses did not render competition hard and difficult, and if the directors of the great French systems had not narrow views. A contract has just been let at La Haye for 2000 tons of iron rails required for the Dutch State Railways. The lowest tender was that of the Acoz Forges Company, which offered to supply the lot at 20,350l. The Ebbw Vale Steel, Coal, and Iron Company (Limited) tendered at the sum of 23,300l.; Messrs. Hopkins, Gilkes, and Co. (Limited), at 21,425l.; and Messrs. Bolckow, Vaughan, and Co. (Limited), at 21,182l. Upon the same occasion a tender was accepted from M.M. Cail and Co., of Paris, for the construction of an iron bridge near Rotterdam, for the sum of 87,200l. Belgium has thus once more vindicated its reputation for cheapness.

Copper has been somewhat firmer. At Paris, Chilean in bars, delivered at Havre, has made 81l. 10s.; ditto ordinary descriptions, 79l. 10s.; ditto English tough cake, 84l.; and Corocoro minerals, pure copper, 80l. per ton. At Havre, Chilean in bars has made 78l. to 80l.; refined ditto in ingots, 84l.; Peruvian minerals, pure standard, 80l.; and United States, Lake Superior, 88l. per ton. At Rotterdam, Drontheim has been quoted at 50l. to 52l.; and Russian Crown, at 51l. The Dutch tin markets have continued firm; disposable Banca has been dealt in at 57½ l. to 57¾ l.; at the last dates these terms were current without sellers. Large deliveries which have recently taken place have reduced the quantity of Banca disposable to 10,000 ingots, and this circumstance renders holders extremely tenacious and difficult. For delivery at the approaching sale, the rate paid for Banca has been 56¾ l. and 57 l. In Billiton there have been some transactions at 54½ l. to 54¾ l. At the close of August the current price of Banca in Holland was 56¾ l., as compared with 78¾ l. at the close of August, 1873, and 57¾ l. at the close of August, 1872. At Paris Banca, delivered at Havre or Paris, has brought 101l.; Straits, delivered at Havre or Paris, 97l.; and English, delivered at Havre and Rouen, 98l. per ton. There has been little change to report in lead, which has continued firm. At Paris, French lead delivered at Paris, has brought 21l. 4s.; Spanish, delivered at Havre, 21l. 4s.; English, delivered at Havre, 21l. 4s.; and Belgian and German, delivered at Paris, 21l. 4s. per ton. At Rotterdam, Stolberg has made 12½ l.; Spanish, 12½ l.; and German of various marks, 12½ l.

The adjudication of a contract for steel rails at the Brussels Northern Railway station has engrossed the attention of the Belgian metal trade. When the tenders were opened the contract was awarded to the lowest offer made, by the Rhenish Steel Works, at Ruhrort, of 10l. 7s. 6d. for the 7000 tons of Bessemer steel Vignoles rails required by the railway company in question. The price has astonished everyone, and the different tenders are the subject of much comment. The famous firm—or, rather, limited liability company—J. Cockerill, of Seraing, had tendered at 10l. 16s.; the Bochum Company, another large concern, was not able to offer to supply the rails at less than 11l. 3s.; and the well-known Creusot Works, belonging to M. Schneider, who, for a similar contract offered in Germany, tendered lower than any home manufacturers, stated its lowest price as at 12l. 4s. The Germans have, therefore, beaten the Belgians on their own ground by more than 8s. 6d., and this is not the first time that such a thing

has occurred. The result of such an anomalous state of things will, it is thought, cause a revolution in iron manufacturing, and the problem which now remains for the ingenuity of Belgian manufacturers to solve is as how to produce steel as economically as iron. The price at which Seraing tendered—10l. 16s.—was generally regarded as famine prices, and it was thought that the works in question had made such a low offer merely with a view of using up old stock, or of keeping all their men fully employed. Opinions have not altered, and two of the largest works at Charleroi are in treaty with an inventor for a process which will enable them to decrease to a minimum the difference between the prime cost of manufactured steel and iron. The contract for the railway referred to also included 20 lots of iron rails, for which the offer of 8l. 17s. 6d., made by the Acoz Forge, has been accepted. This fact is not surprising when the present market prices of manufactured iron are taken into consideration gives rise to this question—Will railway companies continue to use iron rails when, for the relatively small difference of 30s. per ton, steel rails can be obtained? Everything tends to the belief that the age of iron has passed, and that in the future it will be replaced by steel, and this opinion receives fresh confirmation when anyone takes into consideration the gradual fall in the market value of steel, owing to the discoveries and inventions which each day lessen the cost of its production.

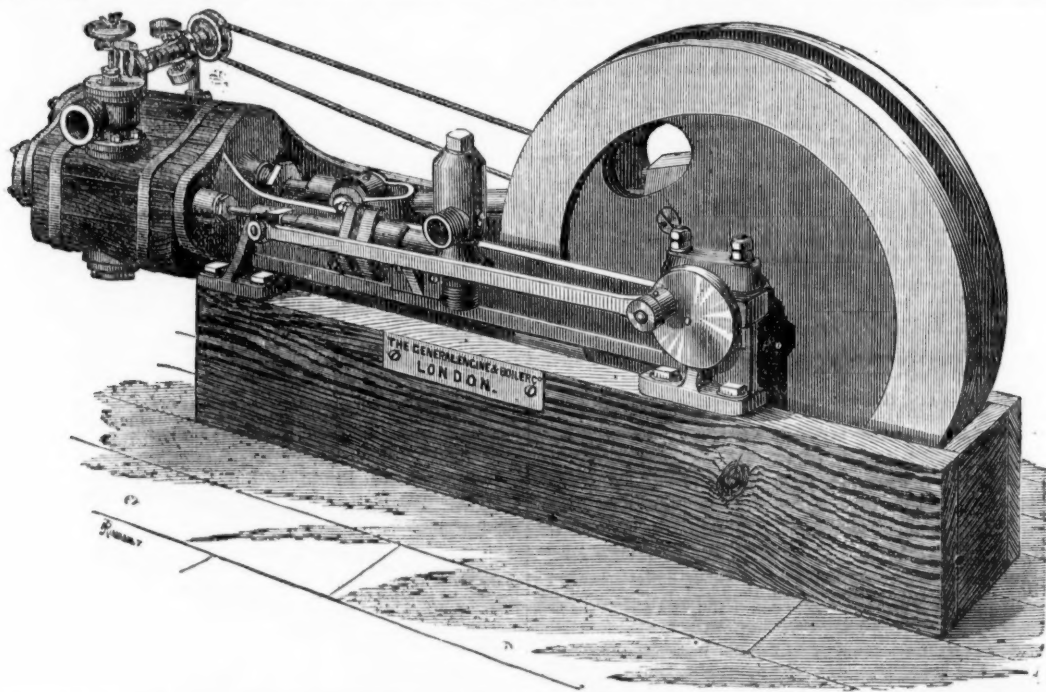
The price of coal has been pretty well maintained upon the Belgian markets, the demand having been fairly sustained. At Liège there has been less activity in coal than at Charleroi; nevertheless, the first winter orders have come to hand, and it is expected that prices will show firmness if they do not exhibit an advance. At Mons the demand is more pressing, and an advance has been decided on this month; this advance is 10d. per ton on industrial coal and coke, and 1s. 8d. per ton on coal for domestic purposes. This advance appears, however, rather premature; it would have been better to have waited until orders became more considerable and more general. The Falmuc Collieries Company has declared an interim dividend for 1874; this dividend is 2l. 12s. per share.

The Couillet Iron, &c., Company has reported progress for 1873. Notwithstanding the crisis, the production effected by the company last year was very considerable; the iron and coal produced brought good prices, but pig suffered to some extent from the competition of similar products in the Grand Duchy of Luxembourg. Notwithstanding large redemptions and repayments, the balance of profit for the past year was 52,411l. The lion's share of the profits realised last year accrued from the company's collieries.

The French coal trade has remained quiet, and has not profited from the slight improvement indicated upon the Belgian coal markets. In the Nord and in the Pas-de-Calais care has been taken not to accumulate stocks, and to reduce the extraction as much as possible. A slight upward movement may possibly take place towards the commencement or the middle of next month, but unless this movement is justified by a real influx of orders it will be of short duration. As directors of coal mining companies are well aware, a reduced working is onerous, and raises the cost price. Moreover, large buyers may offer a serious resistance to an unjustifiable or premature advance. If the state of metallurgical industry continues to improve, and if various other industries revive, the price of coal will revive also, but probably not otherwise. As regards the coal trade of the Loire, affairs are almost nil, and prices are nominal, as in the Loire basin metallurgical industry is more depressed than in the other parts of France.

The state of the French iron trade still remains tolerably good. The situation is not very prosperous, and the future is not exempt from anxieties; nevertheless, the present is supportable, and there is, upon the whole, a sensible amelioration in affairs. Orders arrive in sufficient quantity, almost everyone has employment, and prices are maintained with a firmness which would expand into an advance if the least encouragement were forthcoming. Pig has been tolerably well maintained, and refining, charcoal made, is quoted more frequently at 5l. 4s. than at 4l. 16s. per ton. First-class merchants' iron has been quoted at 9l. 12s. per ton at Paris; construction plates have made 13l. 4s. per ton. Rails are quoted upon the French markets at about 9l. 12s. per ton, and steel rails range between 12l. and 13l. 4s. per ton, although the Creusot Works tendered recently in Belgium at 12l. 4s. per ton, a rate which must be pronounced much lower, if account is taken of transport expenses, import duties, &c. Old iron is in request at 5l. 12s. per ton. The Chatillon and Commeny Forges Company will pay, Sept. 15, the balance of its dividend for 1873, or 30s. 6d. per share.

## GENERAL ENGINE &amp; BOILER COMPANY'S NON-CONDENSING ENGINE.



THE GENERAL ENGINE AND BOILER COMPANY'S PATENT NON-CONDENSING ENGINE.

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iron standards, exactly after the style of a lathe bed, the engine runs as steadily as an engine can, and complete access is thus had to every side of the engine, as will be easily understood from the engraving, in which, however, the engine is shown mounted upon a wooden foundation.

In the case of the smaller powers, or of engines with cylinders less than 6 in. in diameter, the General Engine and Boiler Company use a single slide-valve, so arranged as to cut off steam at half-stroke, and thus to expand it twice. Larger engines are fitted with a separate variable automatic expansion valve and gear under the control of the governor. This gear, which is on Northcott's patent, gives an excellent expansion curve for rates of expansion, varying from about sixteen times to three times. The non-condensing engines are calculated to work with a normal rate of eight times, and the extreme rates of sixteen and three are only used when the load upon the engine becomes very much reduced or increased. These engines are certainly calculated to work with less coal than the rough and heavy engine ordinarily employed for small powers, and we look upon them as very favourable specimens of steam engineering. As to the larger sizes of non-condensing engine, the General Engine and Boiler Company guarantee a consumption of coal less than that of most condensing engines, and they adapt them to pumping, winding, &c., as well as for driving factory machinery.

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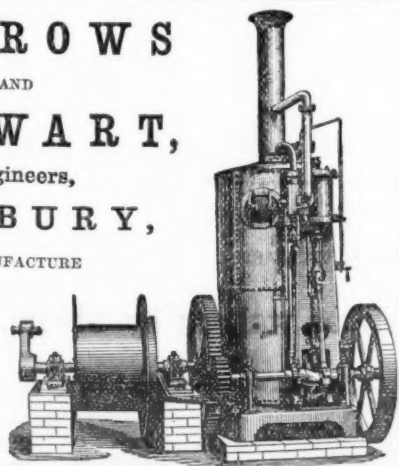
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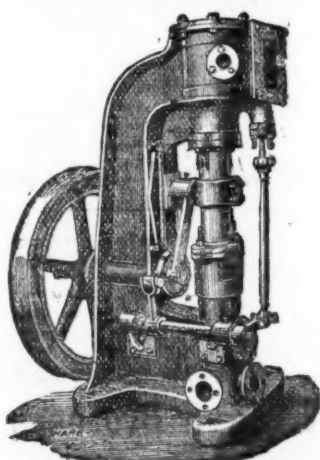
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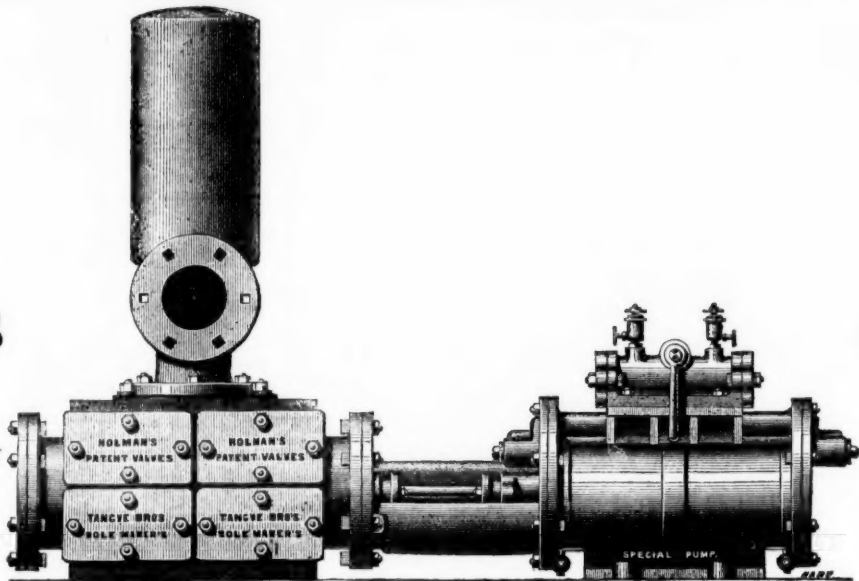
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Length of Stroke.....	Inches	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour.....		20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	40,000
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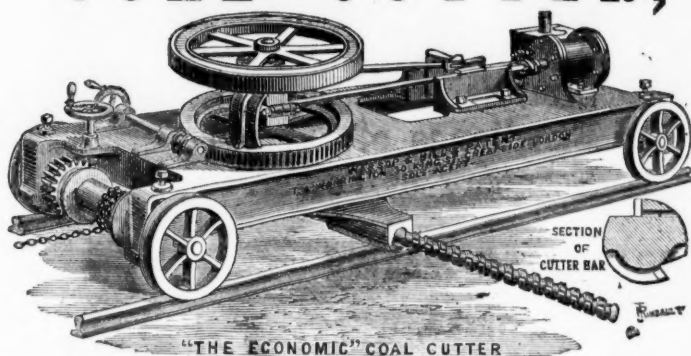
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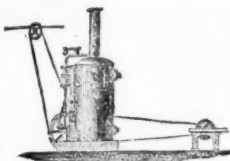
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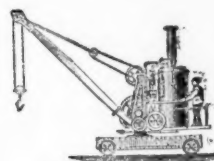
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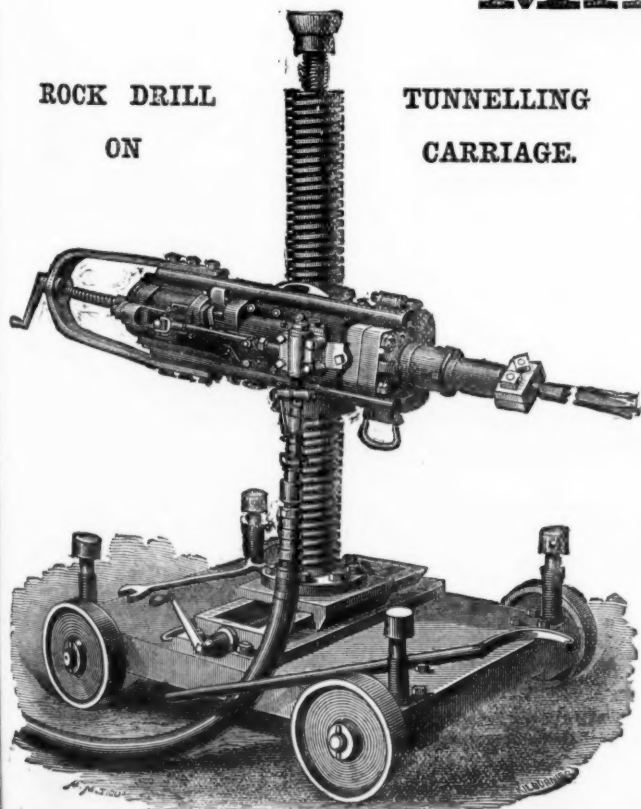
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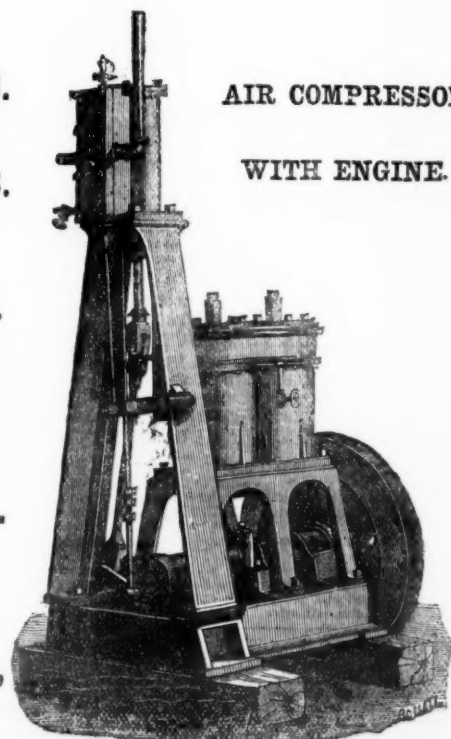
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ROCK DRILL  
ON

TUNNELLING  
CARRIAGE.



AIR COMPRESSOR  
WITH ENGINE.

The Drills (in 5 Sizes) can be Mounted on any Description of  
Carriage or Support, according to the Nature of the Work.

Adapted for Driving Rock Drills, Coal-  
Cutting, Pumping, and Underground Ma-  
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# Ore Crushers, with H.R.M.'s New Patent Crushing Jaw.

EXTENSIVELY USED BY  
MINE OWNERS.

Few Working Parts.  
Small Wear and Tear.  
Freedom from Breakage.  
Simplicity of Construction.  
Excellence of Sample.  
Economy of Power.

ALSO,

## ROAD METAL-MAKING MACHINES,

WITH

## H.R.M.'s New Patent Cubing Jaw.

FOR

REDUCING THE MATERIAL  
TO  
ANY REQUIRED SIZE.

EXCLUSIVELY ADOPTED BY HER  
MAJESTY'S GOVERNMENT.



# H. R. MARSDEN, LEEDS,

ENGINEER,

Immense Saving of Labour.

# Mining Improvements, Revolving Picking Table.

950 NOW IN USE.

AWARDED 45 GOLD AND SILVER MEDALS.

By the PATENT MACHINE

HERE ILLUSTRATED

60 to 70 Tons of Ore

MAY BE

CRUSHED OR SEPARATED

PER DAY OF TEN HOURS.

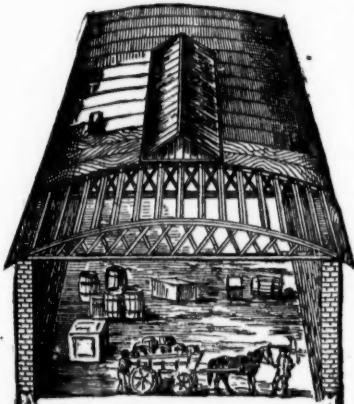
EXTRACT FROM TESTIMONIALS:

"Although I have travelled hundreds of miles for the purpose of, and spent several days in, examining what are styled ORE CRUSHERS, yours only embrace and combine the true principles of action and construction for the purpose designed."

CATALOGUES FREE on application to

H. R. MARSDEN,  
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FOR  
GREAT ECONOMY  
AND  
CLEAR WIDE SPACE.

For particulars, estimates,  
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The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheathed with 1/4 in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 40s. per square, according to span, size, and situation.

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INODOROUS FELT for lining damp walls and under floor cloths.

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Wholesale buyers and exporters allowed liberal discounts.

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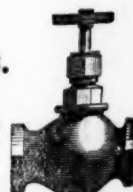
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